MANUFACTURERS' RECORD

A WEEKLY SOUTHERN INDUSTRIAL, RAILROAD AND FINANCIAL NEWSPAPER

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BALTIMORE, JANUARY 3, 1907.

SOUTHERN LUMBERING.

Nearly half of the lumber produced in this country annually is now cut in the South. With the co-operation of the National Lumber Manufacturers' Association, the North Carolina Pine Association, the Yellow Pine Manufacturers' Association, the Southern Cypress Association, the Northern Pine Manufacturers' Association, the Western Pine Manufacturers' Association, the Pacific Coast Lumber Manufacturers' Association and other organizations, the Forest Service of the National Department of Agriculture has compiled and published detailed statistics of the lumber cut of the United States in 1905. Though confessedly incomplete, the figures show that 11,666 establishments cut 30,502,961,000 feet of lumber in that year. Of that amount 12,330,683,000 feet were cut in the Southern States as follows:

States.	Mills.	Feet.
Alabama	326	843,897,000
Arkansas	466	1,488,589,000
Florida	123	658,007,000
Georgia	349	712,604,000
Kentucky	426	464,676,000
Louisiana	236	2,293,809,000
Maryland	114	163,749,000
Mississippi	355	1,299,390,000
North Carolina	671	1,080,602,000
South Carolina	205	466,478,000
Tennessee	496	540,920,000
Texas	165	929,863,000
Virginia	458	715,197,000
West Virginia	285	672,902,000
Total	4,674	12,330,683,000
United States	11,666	30,502,961,000

Of the 47 States and Territories where the industry is carried on, but 11 cut more than 1,000,000,000 feet. Of these, Washington led with 3,917,166,000 feet, with Wisconsin second with 2,543,503,000; Louisiana third with 2,293,809,000, Minnesota fourth with 1,925,804,000, Michigan fifth with 1,719,687,000, Arkansas sixth with 1,488,589,000, Pennsylvania seventh with 1,397,164,000, Mississippi eighth with 1,299,390,000, Oregon ninth with 1,262,610,000, North Carolina tenth with 1,080,602,000 and California eleventh with 1,061,608,000 feet.

The largest cut of any one wood was that of yellow pine, 8,771,966,000 feet, not including 988,542,000 feet of Western "yellow pine," of which all but 199,596,000 was cut in the South, Louisiana leading with 1,737,960,000 feet. The Southern cut of yellow pine was 3,704,350,000 feet greater than the total cut of white pine in the country, not including 115,678,000 feet of Western "white pine," and 2,984,027,000 feet greater than the total cut in the country of the oaks, maples, chestnuts, hickories, walnuts and all other hardwoods, aggregating 5,588,343,000 feet. Arkansas led in the cut of red gum and cottonwood, Kentucky in yellow poplar, Louisiana in yellow pine and cypress, Tennessee in red oak and West Virginia in the cut of white oaks.

Three Southern States—West Virginia, North Carolina and Virginia—contributed materially to the cut of white pine, West Virginia to hemlock, Kentucky to beech, and Arkansas, Kentucky, Mississippi, South Carolina and Tennessee to ash, and Arkansas, Kentucky, Tennessee, Mississippi and West Virginia to the cut of hickory.

Six Southern States—Louisiana, Arkansas, Florida, Mississippi, South Carolina and North Carolina—cut 704,175,000 of the total of 753,369,000 feet of cypress, eight States—West Virginia, Kentucky, Tennessee, Arkansas, Virginia, Mississippi, North Carolina and Alabama—cut 720,137,000 of the total 1,210,216,000 feet of white oak, seven States—Tennessee, Arkansas, Kentucky, Mississippi, North Carolina, West Virginia and Virginia—cut 337,906,000 of the total 623,553,000 of red oak, eight States—Kentucky, West Virginia, Tennessee, North Carolina, Virginia, Alabama, Mississippi and Georgia—cut 497,712,000 of the total 582,748,000 of yellow poplar, four States—Arkansas, Mississippi, Tennessee and Kentucky—cut 196,167,000 of the total 316,588,000 feet of red gum, four States—Arkansas, Mississippi, Louisiana and Tennessee—cut 201,758,000 of the total 236,000,000 of cottonwood, and six States—Tennessee, North Carolina, West Virginia, Kentucky, Virginia and Maryland—cut 119,133,000 of the total 224,413,000 feet of chestnut.

The conference under the auspices of the Alabama Immigration Association, which drafted a bill looking to an annual appropriation for four years of $20,000 for the maintenance of a State immigration bureau, did well to cut out the proposition for a labor department in connection with the bureau. Most State labor bureaus are absolutely antagonistic to the interests to be subserved by healthy immigration.

THE SOUTH'S SHARE IN WORLD-WIDE DEVELOPMENT.

Though not intended as a special issue, the MANUFACTURERS' RECORD of today consists of 52 pages of reading matter and 144 pages of advertisements, a total of 196 pages. If set up in the ordinary book size, this issue would be over 1000 pages. The 52 pages of reading matter if set in the size of type in which most books are printed and made up in that form would make a book of about 400 pages. We are thus giving to our annual subscribers for 8 cents and to others for 10 cents a book of 400 pages of reading matter and nearly double that in advertisements. Where else in books or in newspapers can one find such a combination of remarkable articles covering the things which every business man must of necessity desire to know? Here is a broad discussion of the world's coal and iron and steel and cotton interests by the most noted living experts in these lines. Here are facts about the South of great moment to men of every section. Here are views and reviews. Here are massed the statistics which tell what has been done and point to what shall be done. Read this list:

THE INTERNATIONAL OUTLOOK IN THE IRON TRADE.
By J. Stephen Jeans, Secretary British Iron Trade Association.

A REVIEW OF THE COTTON SITUATION.
By Col. Alfred B. Shepperson of New York.

COAL IN THE UNITED STATES AND OTHER COUNTRIES.
By Edward W. Parker of the United States Geological Survey.

MILLIONS FOR DEVELOPMENT IN THE APPALACHIAN SOUTH.
By Albert Phenis of West Virginia.

MISSOURI'S GREAT ZINC AND LEAD MINES.
By S. F. B. Morse of New York.

THE COTTONSEED AND ITS MANY PRODUCTS.
By L. A. Ransom of Atlanta.

SUSQUEHANNA POWER DEVELOPMENT AND NAVIGATION.
By Stevenson A. Williams of Maryland.

WHERE THE WORLD WILL MEET ON SOUTHERN SOIL.
By President H. St. George Tucker of the Jamestown Exposition.

GROWTH OF SOUTHERN FACTORY DIVERSIFICATION.
By Edward Ingle.

STRIDES IN SOUTHERN COAL MINING.
By Frederick E. Saward of New York.

PETROLEUM IN SOUTHWESTERN FIELDS.
By Holland S. Reavis of Texas.

A YEAR'S ACTIVITY IN SOUTHERN RAILROAD BUILDING.
By Samuel G. Wilmer.

MANUFACTURES AND MINING IN OKLAHOMA.
By S. M. Posegate of Missouri.

IRON AND STEEL OUTLOOK IN THE SOUTH.
By James A. Green of Cincinnati.

THE SOUTH AS A PLACE TO LIVE IN.
By I. S. Field.

NEARLY $20,000,000 IMPROVEMENTS UNDER WAY IN BALTIMORE.
By William H. Stone.

A YEAR'S PROGRESS IN SOUTHERN TEXTILES.
By Herbert C. Caldwell.

A PLAN TO FACILITATE SOUTHERN IMMIGRATION.
By Herman Badenhoop of Baltimore.

THE SOUTHERN FARM HOME.
By Andrew M. Soule of Virginia.

We do not believe that any other publication in America has ever grouped into one issue so many striking articles of such value to business men. We are justly proud of this showing, but we are still prouder of the still more important showing in our advertising pages, where over 1000 of the very cream of American business houses are represented. Here are presented facts of deepest interest to every buyer and seller, whether in manufacturing, mining, financial or professional life. This endorsement of more than 1000 of the great advertising houses of the country is worth regarding with pride. It is a showing which in variety and character of the houses represented cannot, we are sure, be matched by any other publication in the world. Broad as that statement is, it will bear the closest investigation. There may be one or two weekly publications which carry a few more advertisements in some particular line, but in variety and in high standing of the concerns represented we challenge comparison with any publication, daily, weekly or monthly, on earth. Look for a moment at these advertising pages. There will be found the advertisements of the United States Government, of State and municipal authorities, and of the very foremost concerns in America engaged in every line of industry, and many of the strongest and most conservative financial concerns North and South. But why try to particularize? There are a thousand or more of these advertisers, and many of them have been in the MANUFACTURERS' RECORD 5, 10 and 15 years, and there be some who started with us nearly 25 years ago. It is an inspiration to do business with so many of the foremost concerns of America and to have their friendship increase as their years of acquaintanceship increase. Those who have been longest with us are the most ardent friends of the MANUFACTURERS' RECORD, and this is true both as to advertisers and subscribers. To one and all, to every

reader, even to those who borrow it from some friend instead of subscribing for themselves, to advertisers new and old, to those who are yet to become subscribers and advertisers, to our enemies—and there is probably no man or paper worthy to play a full part in the world's affairs without having some critics or enemies—to one and all we extend the greeting:

A Happy and Prosperous New Year.

May it crown with the richest blessings all whom we have enumerated.

May readers and advertisers become warmer friends than ever, and may enemies learn to stand out in the open and fight squarely and honestly instead of being bushwackers.

CONCRETE AND ITS USES.

Scarcely a day passes without some important announcement of new and broader uses for concrete construction. Owing to the rapidity of industrial development in the South, to the utilization of water-powers requiring immense dams, to the building of new and larger warehouses and railroad depots, there is a rapidly-widening market in this section for cement. The development of the Portland-cement business is without a parallel in industrial history. With increasing activity in all lines of business throughout the South there must inevitably be a great expansion in the consumptive requirements of this section. Many cement undertakings are now being projected looking to the building of large plants in the South, and it behooves the leaders in such enterprises to select their locations with exceeding care and to secure ample capital not only to build the plant, but to provide a working margin. A distinguished expert has said that "while cement-making ingredients are found almost everywhere in the South, just as iron ore is found widely scattered over the country, it is nevertheless almost as difficult to find an ideal cement location as it is to find an ideal site for a furnace." If the South would avoid in cement-making the many mistakes made 15 or 18 years ago in the building of furnaces at points not suitable for iron-making, the development of this industry should be followed with exceeding care. There is vast room in the South for the cement business, but no one should undertake to go into such an enterprise haphazard and without the advice and direction of the very best skill that can be had.

In this period of world-wide activity and expansion of industry, of higher prices for iron and steel and lumber, it is essentially important that new materials for construction work should be provided. Cement comes to supplement iron and lumber, and not to supplant them. This industry will develop far more rapidly even than iron and steel, and in time may almost rival the iron industry in extent and in the amount of capital invested. Repeating from a recent editorial in the MANUFACTURERS' RECORD the statistics of the trade as compiled by the United States Geological Survey, we have the following, showing the production since 1880:

Year.	Plants in operation.	Output in barrels.	Value of output.
1880	..	42,000	$126,000
1881	..	60,000	150,000
1882	..	85,000	191,250
1883	..	90,000	193,500
1884	..	100,000	210,000
1885	..	150,000	292,500
1886	..	150,000	292,500
1887	..	250,000	487,500
1888	..	250,000	487,000
1889	..	300,000	500,000
1890	16	335,500	704,050
1891	17	454,813	967,429
1892	16	547,440	1,153,600
1893	19	590,652	1,158,138
1894	24	798,757	1,383,473
1895	22	990,324	1,586,830
1896	26	1,543,023	2,424,011
1897	29	2,677,776	4,315,891
1898	31	3,692,284	5,970,773
1899	36	5,652,266	8,074,371
1900	50	8,482,020	9,280,525
1901	56	12,711,225	12,532,360
1902	62	17,230,644	20,864,078
1903	71	22,342,973	27,713,319
1904	79	26,506,881	23,355,119
1905	84	34,000,000	32,000,000

The production for 1906 is not yet obtainable, but it is estimated that it will run between 40,000,000 and 45,000,000 barrels. As late as 1900 the total Portland-cement production of the country was only 8,400,000 barrels, against the 40,000,000 or 45,000,000 barrels for 1906. The increasing wealth of the South must of necessity bring about a very great increase over what we have yet seen in railroad building and in all other forms of construction work. Solid concrete piers and culverts must take the place of the flimsier construction of former times. Advancing prices of lumber will force the utilization of concrete in the building of mills and warehouses and other large structures, thus bringing about a demand for cement far in excess of the trade today. The South should get ready to handle this business. At present it is quite largely dependent upon the cement plants of other sections, and it is barely possible that the consumptive requirements will continue to grow more rapidly than local production can be developed, thus continuing for years to come the South's dependence upon other sections for much of its cement. But in this industry there is a wide field for the employment of skill and capital to the great benefit of the business interests of the whole South.

Advertisements of Southern localities offering special advantages for the location of manufacturing enterprises will be found on pages 128, 129, 130, 131, 132, 133 and 134.

APPRECIATED.

Two letters received within the last few days are illustrative of many hundreds which are constantly coming to the MANUFACTURERS' RECORD. Mr. Edgar G. Harris, editor of the Delta *Register*, Clarksdale, Miss., writes:

> Please do not overlook us in arranging your exchange list for 1907. The MANUFACTURERS' RECORD is the greatest exponent of the new and expanding South. It is full of inspiration and a benediction to the writer. Each issue is read religiously by the entire office staff.

It is because the MANUFACTURERS' RECORD is held in this high esteem and is so closely read by thousands of people North, South and West alike that we get such letters as the following from Mr. W. F. Reeves, Department of the Interior, Harrison, Ark., who, referring to a small advertisement in our "Classified Opportunities" Department, wrote:

> I have received more letters of inquiry from my advertisement in the MANUFACTURERS' RECORD concerning zinc lands in North Arkansas than from five other papers and magazines in which I am advertising, which speaks volumes for your publication as an advertising medium.

It is with a profound sense of appreciation that letters of this kind are received, and it is with a full realization of the responsibility upon us in the light of such words of commendation that the MANUFACTURERS' RECORD ceaselessly strives to press with untiring zeal for the best development of the South and the country at large, and opposes with equal zeal whatever it believes to be against the best interests of the South and the country.

OUR REAL WORLD POWER.

When we study the relative advantages of all Europe and of the United States for the support of population and the development of agricultural and industrial interests; when we think of our remarkable agricultural location and our vast and varied resources, we can but be dazzled at the brightness of what the future promises. Of coal the United States has 350,000 square miles as against 51,000 for Europe, and of iron ore we probably have as much as all Europe. We dominate the world's trade in cotton—an industry second only in value of annual production to iron and steel. We produce a large part of the world's copper output, and the extension throughout the world of the varied electrical interests dependent upon copper must, to a great extent, be controlled by this country. We have many millions of available water-power, which we are now preparing to utilize on a large scale. We produce over 3,500,000,000 bushels of corn and wheat against 2,000,000,000 for all Europe. With great inland seas, with nearly 40,000 miles of rivers capable of being made navigable at a moderate cost, with a long seacoast on the Atlantic and the Gulf and the Pacific, we have facilities for the development of river traffic greater than all Europe possesses. Moreover, our country is homogeneous and not disturbed in its business operations by the arbitrary laws of differing nationalities as in Europe. We could readily support without any crowding a much larger population than that of the United Kingdom and the Continent combined. We could feed them from the products of our soil, clothe them with home-grown cotton and wool and furnish the raw materials for industrial activities far greater in extent than all Europe now has, greater, in fact, than all the present manufacturing business of the whole world, and keep up that pace almost indefinitely. As a nation we have been given natural resources and natural advantages beyond our power to fully grasp, but we do know that of all countries on earth this seems to be favored of Heaven more than any other. Our big, broad national development is beginning. We think of it as already large, but, in reality, it is very small compared with what we shall see in the future.

Our responsibility for advancement in religious life, in right education, in moral stamina, in self-reliance and independence in character, and, at the same time, in a due sense of our obligation to point the world to higher standards of individual and national life is commensurate with our marvelous advantages.

We are a great world power; we must not forget that we have great world duties.

THE DEMAGOGIC AGITATOR VS. UNBOUNDED PROSPERITY.

What a wonderful story of progress and prosperity has been recorded to the credit of 1906! Surely the new year begins, as the old one passed away, in a blaze of material glory. Never before in human history was such marvelous material advance made in any year. Never before has there been such an advance in wages. Never before has the whole country—yes, almost the civilized world—been so short of laborers. Really, the world's expansion in industry seems to have run far ahead of the world's supply of men.

Once people dreaded the labor-saving machine as destined to lessen the demand for men. The power loom was fought as though it had been an invention of the evil one. Many inventions were decried as sure to prove the destruction of the mechanic and the wage-earner. The stagecoach driver thought the railroad the devil's own device for killing his business, and here and there in this country and abroad great labor-saving inventions were met with riot and bloodshed. The press even in many cases took sides against improvements which temporarily tended to lessen the employment of laborers, and even the pulpit occasionally, with but little knowledge of what was doing, turned from its rightful field to denounce improvements and methods which were thought would reduce the number of men employed. Because unprofitable factories were abandoned or moved to better fields, because many plants were at times consolidated in obedience to an economic law which upbuilds or destroys regardless of man's intentions, there went up throughout the land but a few years ago such howls of indignation and such bitter denunciation of the heartless wretches who were enslaving the working people that one wonders what these critics must now think of themselves. Then, when business was slack and laborers tramped the streets begging for employment, the great corporations had to stand bitter criticism for every move they made looking to the reduction in the cost of production. Now, when these same corporations are struggling in vain to find men enough to do the work in hand, when railroad earnings are millions less than they would be if men and materials could be had for building more rolling-stock and more track, when coal mines and furnaces cannot because of lack of labor and lack of cars produce the coal and iron to meet the demands of the hour, they are all bitterly assailed by just the same people who a few years ago denounced them for other things.

Verily, it seems that our people, from the highest officials to the lowest demagogic agitators, are without normal poise or balance. They are carried away by every wind that blows, neither knowing nor caring to know the actual facts. Each one, fearing that some other agitator will be first or loudest in denunciation of some imaginary evil and thus attract the largest share of attention from the unthinking masses, rushes to the front to see how much noise he can make. Apparently, men seem to have stopped thinking for themselves. The mob spirit rules the day, and press, pulpit and public platform to a large extent accepts as true every falsehood vociferously put forth by agitators, great or small.

In times of distress, when gaunt woe and hunger stalked over the land, when souphouses furnished the only food which thousands and tens of thousands could secure, when wheat and corn and cotton sold for less than the cost of raising, when bankrupt railroads reached a point where they were referred to as "two streaks of rust," when every day's most striking news was the list of factories closed and of old houses gone to the wall, it might have been excusable for pessimism to call forth agitation and denunciation, but what possible excuse can be found now?

Today we find farmers growing in wealth beyond anything they could ever have dreamed of a few years ago; we find mechanics and day laborers in such demand as never before, with wages double what they were 10 years

ago; we find the advance in values of city and country property, in minerals and timber lands, making millions fairly rich; we find that in six years the wealth of the farmers has grown from $20,400,000,000 to $28,000,000,000, a gain of $7,600,000,000, which is more than one-half as much as the total capital owned by all the manufacturing interests of the country, and is nearly ten times as much as the entire national banking capital of the United States. Instead of wealth being concentrated in a few hands, it is being more widely diffused than ever before. Never before were so many people getting rich, and never before were the masses steadily advancing to such a high plane of comfort and conveniences of life.

Despite it all, and remembering none of these things and caring less; instead of reverently calling the people to thanksgiving and rejoicing for the blessings we enjoy and invoking a Divine blessing in the continuation of this golden era which lights up all civilization with its brightness, the agitator is seeking to create unrest and unhappiness by creating a false atmosphere, fatal, if continued, to the highest business development. The agitator of today and the mob spirit which follows him are like the pessimist of whom it has been said, "when given the choice of two evils he gladly takes them both." It is time for the American people to stop and think ere they destroy the goose that is so busy laying golden eggs.

SOME SOUTHERN FARM RESULTS

Ever-increasing interest in the progress of the South, inspired by the notable progress it has made in recent years in manufacturing, in mining, in lumbering and in railroad construction, not infrequently loses sight of that section's agricultural importance, present and potential. When its agriculture is considered, one's mind is prone to dwell upon the cotton crop. That crop in its value is second among the great crops of the country, but it is in such world-wide demand, and the comfort and happiness of so many millions of persons depends upon the great industry of which it is the basis, that it is natural for it to overshadow at times other crops which the South raises, either as specialties or in common with other parts of the country. The estimated share of the South, not including the Territories, in the cotton crop of the season of 1906-1907 is about 11,600,000 bales, valued, with the seed, at probably $650,000,000. No definite figures on that point are yet available, inasmuch as a considerable portion of the crop is yet to come into the market—up to Christmas less than 7,500,000 bales had been brought into sight. But leading as it does the agricultural South, cotton has some valuable allies, as shown by the following values of other crops in 1906:

Corn	$390,921,625
Wheat	62,329,774
Hay	54,899,200
Tobacco	39,924,815
Oats	28,341,394
Irish potatoes	17,199,329
Rice	16,121,298
Rye	1,045,596
Total	$610,783,031

The accompanying tables, based upon figures of the National Department of Agriculture, show the amounts of these several crops and their values by States in comparison with totals for the whole country. The value of the South's corn crop, $390,921,625, was more than half the value of its cotton crop and nearly a third of the total value, $1,166,626,479, of the corn crop of the country. The Southern crop, 729,600,894 bushels, was within a few million of a quarter of the total crop, 2,927,416,091 bushels, of the country. The greater part of the crop outside of the South was raised in Indiana, Illinois, Iowa, Kansas, Missouri, Nebraska and Ohio. But it is interesting to note that the production

Corn.

States.	Bushels.	Values.
Alabama	47,849,392	$30,623,611
Arkansas	52,802,569	24,817,207
Florida	6,875,000	4,262,500
Georgia	52,066,596	34,884,619
Kentucky	105,437,376	44,283,698
Louisiana	26,217,633	15,730,580
Maryland	22,007,825	9,903,521
Mississippi	40,789,207	24,881,416
North Carolina	41,796,846	28,421,855
South Carolina	23,611,233	17,236,200
Tennessee	86,428,912	40,621,589
Texas	155,804,782	77,902,391
Virginia	45,188,523	24,853,688
West Virginia	22,725,000	12,498,750
Total South	729,600,894	$390,921,625
Total United States	2,927,416,091	1,166,626,479

of Texas, 155,804,782 bushels, exceeded that of Ohio, 141,645,000 bushels, and approached that of Indiana, 183,893,767 bushels.

Less than half a dozen of the Southern States can be classed as wheat-growing ones, though that grain was raised last year in all of them but

Wheat.

States.	Bushels.	Values.
Alabama	1,085,029	$1,019,927
Arkansas	1,915,250	1,436,438
Georgia	3,161,070	3,224,291
Kentucky	11,542,598	8,426,097
Maryland	12,902,416	9,160,715
Mississippi	17,610	15,321
North Carolina	5,297,028	4,926,236
South Carolina	2,960,041	3,256,045
Tennessee	10,892,725	8,496,326
Texas	14,126,186	10,877,163
Virginia	9,306,825	7,538,528
West Virginia	4,879,861	3,952,687
Total South	78,086,639	$62,329,774
Total United States	735,260,970	495,332,760

Florida. Here Texas, which led the South in corn growing, also led in wheat growing, with 14,126,186 bushels, taking the place which Maryland held in 1905. The South increased its production from 62,923,404 bushels in 1905 to 78,086,639 bushels, while the whole country made a less increase proportionately, from 692,979,489 bushels to

Hay.

States.	Tons.	Values.
Alabama	109,882	$1,461,431
Arkansas	113,491	1,123,561
Florida	30,000	450,000
Georgia	145,289	2,288,302
Kentucky	603,723	7,999,330
Louisiana	41,472	476,928
Maryland	353,167	4,767,754
Mississippi	83,350	954,461
North Carolina	193,475	2,902,125
South Carolina	88,596	1,351,089
Tennessee	512,563	6,893,972
Texas	683,705	5,811,492
Virginia	534,066	8,278,023
West Virginia	724,338	10,140,732
Total South	4,211,113	$54,899,200
Total United States	57,145,959	592,539,671

735,260,970 bushels. At the same time, the total value of the Southern wheat crop increased from $56,299,021 to $62,329,774, while the value for the whole country decreased from $518,372,727 to $495,332,760. Every State, except Maryland and Mississippi, showed an increased production, and there is no

Tobacco.

States.	Pounds.	Values.
Alabama	260,610	$57,334
Arkansas	656,080	78,730
Florida	4,725,000	1,653,750
Georgia	2,025,000	607,500
Kentucky	252,300,000	19,427,100
Louisiana	28,975	7,968
Maryland	17,724,000	1,205,232
Mississippi	66,000	19,008
North Carolina	69,807,640	6,980,764
South Carolina	8,978,000	942,690
Tennessee	34,069,000	2,555,175
Texas	294,250	70,620
Virginia	73,555,425	6,031,545
West Virginia	3,123,900	287,398
Total South	467,613,880	$39,924,815
Total United States	682,428,530	68,232,647

reason why the total for the South might not be doubled with profit to the growers.

The hay crop of the country was valued at $592,539,671, nearly $98,000,000 greater than the value of the wheat crop. But the proportion was not maintained in the case of the South, whose hay crop brought $54,899,200, less than a tenth of the total for the country, $592,539,671, though the crop itself was nearly 200,000 tons less in 1906 than in 1905, and amounted to 4,211,113 tons of the total, 57,145,959 tons, of the country. New York and Iowa each raised more hay than the whole South. But it must be remembered that in a large portion of the South where grazing is permitted the greater part of the year hay-making has received comparatively little attention.

Oats.

States.	Bushels.	Values.
Alabama	3,167,879	$1,615,618
Arkansas	3,783,706	1,589,157
Florida	394,240	368,083
Georgia	3,362,291	1,882,883
Kentucky	4,430,354	1,683,535
Louisiana	486,227	218,802
Maryland	808,584	307,262
Mississippi	1,626,732	797,099
North Carolina	3,169,724	1,551,165
South Carolina	3,588,292	2,046,826
Tennessee	3,151,330	1,291,041
Texas	31,822,512	13,047,230
Virginia	2,858,634	1,229,213
West Virginia	2,101,200	840,480
Total South	64,701,695	$28,341,394
Total United States	964,904,522	306,292,978

In tobacco, though still preponderating as a producer, 467,613,880 of the total 682,428,530 pounds raised in the whole country being its share, the South had in 1906 a less favorable showing to its credit as to values than had the country at large. For its more than 467,000,000 pounds brought less than $40,000,000, while the 215,000,000 pounds in the rest of the country

Irish Potatoes.

States.	Bushels.	Values.
Alabama	694,350	$645,746
Arkansas	1,666,960	1,116,863
Florida	335,410	368,951
Georgia	664,279	730,707
Kentucky	2,848,352	1,737,495
Louisiana	744,000	558,000
Maryland	2,673,843	1,497,352
Mississippi	478,380	416,191
North Carolina	1,785,900	1,321,566
South Carolina	743,330	780,496
Tennessee	1,793,600	1,112,032
Texas	2,394,469	2,083,188
Virginia	4,174,200	2,796,714
West Virginia	3,334,472	2,034,028
Total South	24,331,545	$17,199,329
Total United States	308,038,382	157,547,392

brought nearly $29,000,000. Kentucky led the country with 252,300,000 pounds valued at $19,427,100, with Ohio second with 74,200,000 pounds valued at $8,533,000, Virginia third with 73,555,425 pounds valued at $6,031,545, North Carolina fourth with 69,807,640 pounds valued at $6,980,764, and Wisconsin fifth with 49,725,000 pounds valued at $6,712,875, these figures giving an idea of the wide range of prices in the several States.

Rice.

States.	Bushels.	Values.
Alabama	31,579	$31,579
Arkansas	131,440	111,724
Florida	82,705	82,705
Georgia	86,135	81,828
Louisiana	8,634,556	7,771,100
Mississippi	21,720	19,548
North Carolina	19,305	18,340
South Carolina	418,792	418,792
Texas	8,428,536	7,585,682
Total	17,854,768	$16,121,298

The comparatively small oat crop of the South, 64,701,695 bushels, valued at $28,341,394, out of the total in the country, 964,904,522 bushels, valued at $306,292,978, finds explanation in the facts about the hay crop, involving, of course, the fact that cottonseed products are fed to stock more largely in the South than elsewhere, and also the

Rye.

States.	Bushels.	Values.
Alabama	30,912	$21,958
Arkansas	23,652	19,631
Georgia	117,910	123,806
Kentucky	162,260	113,582
Maryland	289,649	173,789
North Carolina	169,697	144,242
South Carolina	34,128	42,660
Tennessee	130,468	96,546
Texas	69,029	58,675
Virginia	219,854	153,898
West Virginia	138,299	96,809
Total South	1,375,858	$1,045,596
Total United States	33,374,933	19,671,243

fact that the South is not raising as much stock as it should.

Pennsylvania alone raised in 1906 nearly as many Irish potatoes as all the 14 Southern States, whose crop was 24,331,545 bushels, valued at $17,199,329, the crop being something more than one-thirteenth of the total, 308,038,382 bushels, of the whole country, and its value being nearly a ninth of the total, $157,547,392. There is indication in that that the South is capable of doing much better as an Irish-potato grower, though it already produces probably 80 per cent. of the sweet potatoes of the country.

The South raises all the rice of the country, and its crop last year was 17,854,768 bushels, valued at $16,121,298, the quantity exceeding that of 1905 by nearly 5,000,000 bushels, and the value being nearly $4,000,000 greater than that of the preceding year. There was a falling off in production in Alabama, Georgia and North Carolina, but the great increases were in Louisiana and Texas, although the production in Arkansas rose from 11,340 bushels in 1905 to 131,440 bushels in 1906.

Six States outside the South each raised more rye than the whole South, and Pennsylvania raises more than four times as much. But it is interesting, as indicative of possibilities, to note the crops of rye in 11 Southern States.

Gratifying as these figures are in the main, they suggest that even though so much of the agricultural energy of the South is occupied in raising cotton to nearly half the value of the corn crop of the country, and though it bears the main burden of producing the tobacco, the sugar and the rice of the country, it is not enjoying the strong position that would belong to it were it raising a greater proportion of the country's other crops. For instance, the 729,600,894 bushels of corn grown in the whole South is less than the total grown in Iowa, Illinois and Indiana, and its 78,086,639 bushels of wheat are only a little more than a tenth of the total crop of the country and less than the crop of Kansas alone. No one can doubt, however, that with acceleration of the tendency to diversification in agriculture, already pronounced, every succeeding year will give the South a greater and greater share in the crops common to the whole country while maintaining its prestige as a producer of its specialties.

DESPERATION IN SOCIAL AGITATION.

It is perfectly natural for socialism of the chair, for the self-seeking agitation that, under the guise of philanthropy, would use the power of the State to further ambitions impossible of realization in an appeal to reason and for the sentimentalism of hysteria, the philosophy of the midriff, to be unanimous in the support of the Beveridge scheme for an application of the interstate commerce law to a regulation of the employment of children. The wildness of the scheme is no deterrent; in fact, it is rather an incentive. It is merely a new expression of the attempt which has been made from time to time during the past 10 years to make solicitude for children the cover for legislation by the National Congress, placing in the hands of that body the control of the industries of the country and limiting at many points the freedom of action of individual American citizens. It is but a part of the manifestation of national insanity, which seems to imagine that the Federal Government should be able to cure all ills, with or without regard to consideration for constitutional safeguards or to lessons of well-recorded experience. Aimed ostensibly only at the employment of children in factories, mines and sweatshops, it is really but a beginning, for Senator Beveridge

himself says "that is as far as it should go at present," but students of the situation and men having regard for the future of their country understand, in the light of what has been done in the same direction upon State lines, that, the precedent once set, all the conservatism and stability of the country will be needed to check the stampede to the idea that the General Government may assume power over any activity in the country, provided a sufficiently large and vociferous mob may be assembled to demand such action.

The Beveridge scheme has been projected at a most opportune time for that organization of large, sound, but small caliber, the so-called National Child-Labor Committee of New York City, that had assumed to dominate the domestic affairs of a number of States, and protests of its entrepreneur were of no avail against its purpose to tag on to the latest freak in sociological agitation. It had been pretty well cornered and was ready to grasp at any means of escape from its dilemma.

Comparatively little attention to this agitation had been given by the mass of substantial minds of the country capable of comprehending all phases of a vital question or by easy-going Americans, doubtless impressed, as was expected of them, by the array of names of Greatness that had been persuaded to countenance the undertaking, and taking for granted that the individuals put forward as representatives of the organization were really qualified to render valuable service in the cause of social reform. The assurance of more than one of these representatives was surpassed only by the ability they had displayed in concealing, before they loomed as allies or employes of the so-called National Child-Labor Committee of New York City, their qualifications for dealing accurately with any problem before the country, and their usual attitude, natural to individuals of their antecedents, was that any statement put forth by them, or any mangling of figures, that in the hands of competency might have been of value, was ipso facto not to be contradicted or that it was only necessary for them to imagine some situation for that situation to exist. The climax of the Committee's performance came in the now historic advertisement published by it November 17. That was so flagrant that it is not surprising that individuals capable of presenting facts were present in New York last month to meet the agitation. The representatives of the Committee, after having their little say, were obliged to hasten to the annual meeting of the committee in the West, which is only fairly well acquainted with it. But before leaving New York, with no one to defend them apparently but a couple of women, of course, one of them was reported as putting forth the following limp:

He said there were two questions in this subject to be discussed—the first, the extent of child labor, and, second, the remedies proposed for its abolition. The evils of child labor could not be measured statistically with any great accuracy or convincing results. When measured fairly it was impossible to exaggerate the real extent or the real evils of child labor. His committee, he said, regretted any inaccurate statement concerning the number or condition of child workers. He cited some of Edwin Markham's recent remarks as what he considered a good illustration of the harm of writing without properly ascertaining the facts. He discussed the work of his committee in its efforts to obtain effective State legislation and harmonize the legitimate demands of business interests competing in different States. He considered the Beveridge-Parsons bill, recently introduced in Congress, a measure that would cut the heart out of the child-labor evil at a single blow.

It is refreshing to note the penitent state of mind revealed in the suggestion that "the evils of child labor could not be measured statistically with any great accuracy or convincing results." Statistics so-called have been a main reliance of the committee. But the fault has been not with the statistics, that is, actual figures, but with the inability of the committee to handle the figures properly. It is ludicrous, though, to note that the representative of the so-called National Child-Labor Committee of New York City "cited some of Edward Markham's recent remarks as what he considered a good illustration of the harm of writing without properly ascertaining the facts." That sounds like pot calling kettle black. As a matter of fact, Edwin Markham has just been as proper in ascertaining the facts about child labor as have been representatives of the so-called National Child-Labor Committee, some of whom apparently are unable to recognize a fact when they see it. Typical of the whole miserable business was the assertion made at the National Child-Labor Committee's annual meeting at Cincinnati:

The great fortunes of the abolitionists were founded on slavery in the South; the Northern capitalist is following the same tactics and building immense fortunes on child labor in the Southern cotton mills.

It is not believed that the individual who projected that profound absurdity, thoroughly typical of the movement in which he has gained prominence, really knows what an abolitionist was. He had probably seen the word in a newspaper somewhere. But he is eminently fit to be in the child-labor agitation.

TO FINANCE AN ORE DEAL.

A Buffalo dispatch to New York papers says:

The New York State Steel Co. has filed a mortgage to the Commonwealth Trust Co. of Buffalo, as trustee, to secure an issue of $5,000,000 first mortgage 30-year 5 per cent. bonds. Nearly $3,000,000 of the bonds have already been sold, and the remaining $2,000,000 will be sold at 93½. The company recently leased Mesaba ore properties estimated to contain from two and a half to four million tons of high-grade ore at a royalty of $1 a ton.

With $5,000,000 of bonds to finance less than 5,000,000 tons of Mesaba ore, even the most optimistic of our people must feel that ores are advancing with great rapidity. The royalty of $1 a ton is doubtless correct, but there must be, we think, some mistake in the bond issue or in the amount of ore.

GRATIFYING.

Among the New Year's messages received by the MANUFACTURERS' RECORD, two were especially gratifying. Governor D. C. Heyward of South Carolina wired:

In congratulating the South on its prosperity you must take to yourself and the MANUFACTURERS' RECORD very much credit for all that you have so wisely and well done toward this great growth and development.

Governor Newton C. Blanchard of Louisiana wired:

Along with New Year's greeting to you I know I express the wish of the whole South, for which you are doing so much, that good health and abundant prosperity may be yours for years to come.

AGAINST EDUCATIONAL BEGGARY.

It is reported that but two out of forty attendants upon the meeting at Montgomery, Ala., of the Department of Superintendence of the Southern Educational Association favored the long-discredited but ever-menacing proposition, decked in the horrid grave-clothes of Blairism, of national aid to education in the South. Southern "educational statesmen" and presidents of institutions of "higher education" must have been in the minority at the meeting.

We note that one of the Senators from North Dakota says that he is in favor of seizing the cars of any railroad to carry coal to his constituents. This is, of course, a bit of windy verbosity meant to curry favor with said constituents, and we can only say that this country is not yet in shape to do any such thing. Thank heaven, we have a Constitution to go by!—*Coal Trade Journal.*

Constitution! Great Scott! Has the *Coal Trade Journal* been taking a Rip Van Winkle sleep? A Constitution! Then, for pity's sake, won't friend Saward bring it out and let everybody look at it? We thought that it had long since been lost.

SUGGESTED BY THE ROBERT E. LEE CENTENARY.

[From January *Southern Farm Magazine* of Baltimore.]

One hundred years ago Robert Edward Lee of Virginia was born. The anniversary, January 19, will be observed with all the respect, admiration and reverence due the memory of the character towering amid American nobility and gentility. The story of the life of one of the greatest of Americans will be retold in many settings, his notable traits will be described with varying emphasis, and the world will again be given the chance to apply the much-needed lessons of his career. It is hoped that consideration of the life of Lee as a Christian soldier, stronger in defeat than as the leader of battling hosts, may not overshadow the life of Lee as a gentle man. It would be well, indeed, for some speaker, knowing Lee and able to balance eloquence with judgment, to make the anniversary the occasion for the plea to the country for a return to the principles that dominated the conduct of Robert E. Lee. The oration might be developed from such questions as these:

What would Robert E. Lee think of a civilization that makes possible the hawking and huckstering around for any kind of a handout of names brought into the glowing light of glorious history by participation in the cause which brought him fame, but, unlike him, without the stamina to withstand in comparative poverty and obscurity the temptation of the dollar?

What would Robert E. Lee think of the professional ex-Confederate or the professional Southerner shining for personal profit or prominence in the light reflected from the grave of the Confederacy?

What would Robert E. Lee think of edu-hustling through a Southern Legislature, with an argument that the statue would cost the State nothing, of a bill setting aside one of the two niches reserved for the State in the National Hall of Fame at Washington, which became an act without the signature of the Governor?

What would Robert E. Lee think of educational statesmanship, represented to the world as exponent of the South, describing as "parochial" and as "the middle age clinging to the assured past and doubtful of the uncertain future," the civilization of which Robert E. Lee was one of the fairest typical blooms, and as "entered for good or ill upon its probation as a member of the modern world" the present South, which, the arbitrament of arms accepted, Robert E. Lee, in modesty equaled only by integrity and ability, devoted the last years of his life to training upon right lines?

What would Robert E. Lee think of a Governor in the South discussing before negroes the possibility of boys becoming President of the United States and describing a negro school as "doing much to democratize education in the South," or of an educator in a white institution of the same State saying to the same negroes: "Friend, go up higher. I trust that the South is rising out of Saxonism into humanity"?

What would Robert E. Lee think of the country being informed that "a notable victory for intellectual independence" had been achieved in a Southern college's sustaining as professor of history one so mistaken as to suggest that a mulatto was possibly the greatest man produced in the South in a century with the exception of Lee, and that "not even a black skin and flat nose can justify caste in this country"?

What would Robert E. Lee think of Southern men and women welcoming as a benefactor and as an uplifter of the South the representative of the aims and the methods of a $10,000,000 educational trust, who dared to bring to the South at his own expense for introduction to Southern ladies and gentlemen an individual who signs his name to the expectation that, "as the memories of the slave period fade away, the mere fetich of colorphobia will cease to control our society and marriage may come to be founded not on the color of the skin"?

What would Robert E. Lee think of this uplifter's describing the Movement begetting such manifestations and setting colleges upon the path of beggary as "the best people North and South, working in harmony for the political and intellectual advancement of the negro in the Southern States"?

What would Robert E. Lee think of Southern men and women delighted to associate with men believing in and practicing social equality with negroes?

What would Robert E. Lee think of a successor of his in education suggesting that his spirit was "looking down in benediction" upon any part of the Movement, and relegating to "provincial narrowness, petty animosity, selfish motive and ignoble purpose" those people of the South who oppose the Movement?

What would Robert E. Lee think of countenance given by a following, respectable even in number, in the South, to such a Movement for education of the South—God save the mark!—and all under the spur of the expectation of alms for education?

What would Robert E. Lee think of Ogdenism that attempts to conjure by his name?

Robert E. Lee would feel that, unless the self-reliance and self-respect of the South reassert itself, the Cause in which he was defeated at arms, but with his sword as stainless as his soul, was indeed fought for in vain.

The heart that broke at Appomattox would break again.

Correction.

On page 646 of this issue the statement is made, through inadvertence, that British mills take annually 8,000,000 to 10,000,000 bales of cotton. Those figures represent the European consumption, British mill consumption being between 3,000,000 and 4,000,000 bales.

The Chesapeake & Potomac Steamship Co. has been chartered at Camden, N. J., with office at 419 Market street to conduct a passenger and freight transportation business on the Chesapeake bay and Potomac river; capital $500,000. The incorporators are P. H. Budlong, J. T. Granger and G. B. Chipman of Washington, D. C.

The International Outlook in the Iron Trade.

By J. Stephen Jeans,

Secretary British Iron Trade Association, and Editor *Iron and Coal Trades Review*, London.

[Written for the Manufacturers' Record.]

The present cycle of iron-trade prosperity is in many respects extraordinary. It is of world-wide extent; it has lasted over a long period, and it embraces every branch of the iron industry. It has raised the output of both iron and steel in nearly all countries that produce these metals to a level that was not only not reached, but had not been approached and was probably scarcely dreamt of in previous cycles. It has involved the displacement of certain branches of the iron industry in so far as primacy is concerned, and has secured for the United States a supremacy which would not have been anticipated by the most sanguine believers in the manifest destiny of the land of the dollar only a few years ago. Incidental to all this has been the building up of colossal organizations like the United States Steel Corporation, the German Steel Trust, and the International Rail Syndicate, which more or less have acquired, and evidently mean to maintain, the powers to fix prices and to determine the limits of production, and whose constitution and operations tend to restrict individual initiative and interfere with the success of the private manufacturer. And this movement, apparently almost in its infancy as yet, promises to develop more and more unless restrained by legislation, until we may by and by find the prices of all commodities raised to an artificial level, with results that can only now be dimly foreshadowed.

The Future.

The future of the iron trade is usually considered under two heads, the first being that of the available supplies of reasonably cheap raw materials, and the second the extent and location of its future expansion. On questions of so problematical a character it is natural that very great differences of opinion should prevail. A Swedish professor recently computed that the ore reserves of the world may be taken at 10,000,000,000 tons, and another writer, well known in the United States, has computed that this reserve will be exhausted in about 50 years. As a matter of statistical curiosity, it may be added that Germany is credited with 22 per cent. of the world's available ore supplies, France and Russia each 15 per cent., the United States 11 per cent. and Great Britain only 10 per cent., Europe being computed as owning more than three-fourths of the iron ores still available for the world's use.

It is hardly necessary to add that all such estimates are necessarily more or less imperfect and empirical. Yet the attempt to compute the future industrial outlook of different countries, even on imperfect data, is not only fascinating, but prudent, within certain limits. If it be true that the United States has only 11 per cent. of the world's unexhausted reserves of iron ore, while Germany has not less than 22 per cent., then, so far as the available facts go, the future sceptre of iron supremacy must fall to Germany. No anticipation as to the ultimate destiny of the United States could be more pregnant with great issues. But no good American, and, least of all, no competent judge, is likely to endorse this estimate, having in view the vast unexplored areas of the United States and the relatively well-ascertained geological conditions of the Fatherland. To begin with, the area of the United States is more than fifteen times that of Germany, and much of it is but little known even yet. It is not more than 10 years since I myself, traveling through Oklahoma and Indian Territory, was shown samples of local ores that were declared to be abundant, and the iron resources of New Mexico are also on a large scale. These and many similar facts stand out in bold relief against the anticipation that the iron trade of the United States, with the present known reserves—computed by Professor Tornebohm at only 25 years' supply of the present pig-iron output—may be exhausted in about 25 years.* Both my friend Mr. Birkinbine and Mr. Chas. K. Leith regard the Swedish estimates as much too low, and in that view I am quite at one with them.

*That is, assuming an average annual pig-iron output of only 26,000,000 tons, and assuming, with Messrs. Tornebohm and Leith, that the unexhausted ores will provide 600,000,000 tons of iron.

Life of Iron-Ore Reserves.

It has probably both an academic and a practical interest for business men to see how many years of life, at the present rate of production of pig-iron, the best-known countries are likely to have according to the latest computations. The figures work out as under:

Country.	Pig-iron equivalent of ore reserves in millions of tons.	Term of unexhausted life.
The United States	603	25
Germany (and Luxembourg)	825	75
Great Britain	295	29.5
France	630	210
Russia (and Finland)	637	212.1
Sweden	611	1153
Spain	249	650

According to these figures, it would appear as if the iron industry of Spain might play the part of Macaulay's New Zealander and survey the ruins of the iron works of the United States, Germany and Great Britain some hundreds of years after the last furnace in these countries had ceased to "blow."

In practice it need hardly be said that no such thing is likely to happen. Indeed, whatever the facts as to unexhausted reserves may be, absolute exhaustion of the iron ores of any country is never likely to take place. There must happen in the utilization of iron ores, as Prof. Stanley Jevons predicated in respect to the coal industry, a long period of declining output, until a stage is reached at which it is no longer profitable to produce the mineral, when the mines must be closed and the furnaces will be blown out in favor of some other country or district whose virgin resources continue to keep it to the front.

The Southern States.

I am glad to have learned that in the Southern section of the United States the prospects for the near future are particularly good and the outlook in general is better than the past has hitherto seen. The Manufacturers' Record has announced that Talladega county, Alabama, has recently proved the existence of some hundred million tons, with a general run in the furnace of 44 to 45 per cent. of iron. With conditions such as these and the splendid coal properties which they possess, the industrial future of the Southern States should be assured for many years to come. The Alabama ore fields may be heard of long after the Lake Superior region has yielded up its last ton of known workable ore.

Demands of the Near Past.

As to the future, much, of course, depends on the rate of increase in the demand for iron and steel. In nearly all countries except Great Britain the demand has been more or less steadily progressive, but it does not follow that this increase will continue, although it is probable. The following short table indicates the development of iron-ore demand between 1890 and 1905:

Consumption of Iron Ore, in Thousands of Tons, in Nine Leading Countries.

Country.	1890.	1905.
United States	17,283	44,692
United Kingdom	18,205	21,910
Germany and Luxembourg	10,549	25,414
France	4,720	7,830
Russia and Finland	1,572	4,534
Belgium	1,634	3,103
Austria-Hungary	2,011	3,344
Sweden	741	1,031
Spain	351	836
Totals	57,066	111,894

The increase of consumption in these 15 years was 54,831,000 tons, or nearly 100 per cent. If the same rate of consumption is maintained over the next 14 years it is clear that the quantity of iron ore absorbed by these countries in 1920 would be well on to 200,000,000 tons. This is neither an impossible nor an unlikely figure. Where is the difference to come from? It is perhaps not too much to say that another 100,000,000 tons of ore could not, with our present sources of knowledge, be counted on without at any rate greatly adding to the cost of producing iron ores; consequently, the cost of manufacturing iron and steel would be materially increased. The usual and inevitable effect of increasing the cost of a product in universal use is to limit the demand. This is a law that must apply to iron as well as to other products, and hence we are justified in expecting that higher values will lead to greater economy in the application of iron and steel in all countries alike. Scrap iron will be increasingly sought after, and must increase in value. The more that iron and steel are used the greater must be the quantity of scrap iron available, and this increase of scrap iron will no doubt go some way to fill up the hiatus. Happily, steel is a more durable metal than wrought iron, which it has now so generally displaced. In railway construction steel is generally admitted to have at least three times the durability of finished iron, so that if we had depended on the latter material we should probably have been face to face with an iron famine before now.

Higher Cost Not Yet Limiting Use.

While this higher cost must, as an economical law, tend to limit the use of iron and steel, it is not clear at what higher price the reduced demand is likely to begin. In all countries alike prices of iron and steel have been much higher over the last 12 months than they were for some years previously. Speaking generally, the price of pig-iron for some months past has been nearly twice the price that prevailed in the five years ended with 1898. This fact, however, has not so far tended to limit the demand. On the contrary, there never was so great a demand as there is at the present time. The United States, with an available capacity reckoned at fully 30,000,000 tons a year, is today buying pig-iron from Europe, and seems likely to have to continue to do so. The present demand appears to have more "bottom" than that of any former period, and that is hardly a matter of surprise to anyone who looks carefully into its details, and especially into those of American consumption.

The situation in the United States is quite phenomenal, and has now been so for many years, so that the American Continent must be regarded as a law unto itself. Of the nine leading iron-producing countries, the United States produced in 1905 43.2 per cent. of the total output of pig-iron, and in 1890 the same country produced only 34 per cent. of the total. The figures were as under, in thousands of tons:

Production of Pig-Iron.

	1890.	1905.
Eight leading European countries	17,725	29,928
The United States only	9,203	22,992

Since the year 1890 the production of pig-iron in the United States has increased by 13,789,000 tons, whereas the output of the eight leading countries of Europe has only increased by 12,203,000 tons. It may be probable that this supremacy of the United States will not be maintained in the future to the same extent as in the past, but the American output will continue to make great progress. The facts of the year 1905 are not likely to be soon repeated. In that year the United States made a leap of 6,628,000 tons of pig-iron, whereas the eight principal countries of Europe increased their output of pig-iron by only 2,578,000 tons. The significance of this extraordinary expansion can perhaps be better understood if it is remarked that until 1887, less than 20 years ago, the United States had not in any single year made an advance of over 1,000,000 tons.

Increase of Consumption of Iron Ores

The problem of the future of the iron-ore supplies of the world is pressing for solution in all countries alike. It has hitherto exacted less interest in the United States than in most other countries, because there the supplies within measurable estimation were thought larger than in any other country. In Great Britain iron ores are imported from 25 different countries. Germany and France import iron ores from between 10 and 15 different countries. Among the countries that supply these ores, Spain and Sweden occupy prominent places, but in both there have recently been proposals to tax ore exports and to limit the quantity exported. Germany is much alarmed because the Swedish Government does not favor proposals for an increase in the quantity of ores exported, and because of diplomatic correspondence pointing to the possibility of the higher German interests being endangered as affecting naval construction.

There is an extraordinarily keen competition for the ores of Spain, Sweden and Greece on the part of the three principal iron-making nations of Europe—Germany, France and Great Britain. Of the 25,500,000 tons of iron ore consumed in Germany in 1905, 6,000,000 tons were imported. Of the 7,500,000 tons consumed by France in the same year, 2,100,000 tons were imported. The iron trade of the United Kingdom imported 7,300,000 tons out of a total consumption of 21,910,000 tons, being just about one-third of the total. Belgium may be said practically to import the whole of her iron-ore supplies, although mainly from the adjoining Grand Duchy of Luxembourg and the fields of the Meurthe-et-Moselle and Nancy. Austria and Russia both import and export, and Spain and Sweden are the only European countries that do not at all depend on other nations for any part of their supplies.

Increase of Iron Consumption.

An increase in the consumption of iron and steel from period to period is a natural result of the world's increase of population. But the matter goes very much farther than this increment would carry it. The leading countries of the world have all within recent years increased their per capita consumption of both metals. The following table will show how far this movement has gone in the principal countries between 1890 and 1905 as affecting pig-iron consumption:

Per Capita Consumption of Pig-Iron.

	In 1890. Tons.	In 1900. Tons.	In 1905. Tons.
United States	0.15	0.18	0.28
Great Britain	0.18	0.19	0.20
Germany	0.10	0.16	0.17
France	0.06	0.07	0.08
Belgium	0.17	0.20	0.25
Spain	0.01	0.01	0.02
Russia	0.01	0.02	0.02

It will be noted that the per capita consumption in the United States in 1905 was nearly twice that of the year 1890, and that it was fourteen times that of Spain and Russia, and more than three times that of France.

European Resources.

There has for a number of years past been an impression abroad that Great Britain has reached the extreme limits of her capacity of production. Too much importance should not be attached to abstract conclusions on such a subject. This was the view formulated some years ago by Mr. Andrew Carnegie, when the British output of pig-iron was nearly 2,000,000 tons a year less than it is today. The British output of pig-iron in 1906 will be about 500,000 tons greater than it has been in any previous year, and will exceed by 1,500,000 tons the average output of the last 10 years. In the light of what has recently been achieved by the United States, these do not appear to be remarkable figures, but 20 years ago they would have had quite a different aspect. The case of Germany is much the same as that of Great Britain. This year the Fatherland will produce about 11,500,000 tons of pig-iron, or about 1,250,000 tons more than has been produced in any previous year. So uncertain, indeed, is the future of the iron trade, that only so recently as 1879 Germany was generally understood to have hardly any indigenous ores of material value, when the happy accident of the successful application of the basic process enabled her to utilize the marvelously prolific fields of Alsace-Lorraine, containing supplies probably not overstated at 700,000,000 tons, which she had wrested from France only eight years before. The uncertainty and doubt that were entertained as to the ores of the Meurthe-et-Moselle until the basic process became an assured success are equally a matter of history. There is no need to fear that the ores of Norway and one or two other countries will also before long be successfully utilized.

Old and New Countries.

But before committing ourselves to an alarmist view as to the future of supplies of raw material, I should recommend those who are interested to study an important bluebook, which, on my own suggestion, as secretary of the British Iron Trade Association, the British Board of Trade recently prepared, as the result of information specially obtained from British consular agents in different countries. This volume is not so specific as could be desired as to the extent and value of the various iron-ore deposits dealt with, and it is perhaps more valuable for what it suggests and leaves unsaid than for much that it describes and affirms. But it serves at least to make clear the fact, already sufficiently familiar, but liable under more or less panicky conditions to be forgotten, that iron is the most widely diffused of minerals; that it is to be found almost universally throughout the earth's crust, and that it is quite impossible to say what reserves might be made available if geographical and topographical conditions were not allowed to intervene.

Two things may ultimately be expected to happen as a result of the exhaustion of iron ores in the older countries. These same countries, we may depend upon it, will not resign this supremacy to newer iron-making countries without a struggle, and are likely, therefore, to engage in a fierce competition to hold their own by imports of foreign ores. On the other hand, the newer countries, with all the advantages that belong to proximity to supplies of raw material, must in course of time take a larger share of the world's iron trade, although which of those countries may hold the primacy, if any of them, in 50 or 100 years from now it would be difficult to say. Canada may be expected to take a more prominent place in this race, and so also with China and Japan.

Special Iron Trade Lines.

Each individual country appears to be developing its iron industry along certain special lines at the same time that it is sharing with all other countries more or less in general consumption. The United States are mainly engaged in producing structural steel, wire and wire products and steel rails. Germany appears to pay more attention to wire and general merchant iron and steel. Belgium gives a maximum of attention to structural steel in the form of girders and beams, as well as to rails. The United Kingdom cultivates sheets and plates more extensively than any other product, these being nearly one-half of the total finished products of the country, including tinplates and black plates. It is not likely that the differences indicated will continue to be so marked as they have been, inasmuch as every country aims at complete supply of its own needs.

American and European Exports.

An important phase of the outlook of the American iron industry of the future relates to the extent to which a decline in home demand is likely to be met by export trade. It is not a little remarkable how the iron and steel exports of the United States have fluctuated in the past. Hardly less remarkable are the few categories in which the United States have apparently sought to compete in supplying the rest of the world with iron and steel. Those categories are mainly rails, blooms and billets, wire and structural materials. Of pig-iron, the export has not in any one of the last five years exceeded 85,000 tons. Of iron and steel bars the export has not reached an average of 50,000 tons a year. In sheets and plates the business done in the last two years has been more important, but it is still relatively small account. And yet it is a general belief that the costs of production in the United States are lower than in competitive countries, as they undoubtedly were a few years ago. One is led to the conclusion, either that this condition of things has been altered, or that home demands call for practically the whole output. It is probable that the great capitalization of the Steel Corporation has been an important factor in this matter, and that owing to that fact the days of cheap production of American iron have disappeared—at any rate, until there is a recapitalization on more conservative lines. Meanwhile, of course, the Steel Corporation has things pretty much its own way, and with current unfilled orders to the extent of nearly 8,000,000 tons the competition against it is hardly likely to be very effective. Such competition could hardly, in any case, be of much avail in home markets, except from American sources, owing to the influence of tariff duties. Different opinions prevail in Europe as to the probable effect of a reduction or repeal of those duties, but for my own part I think it may be better for Europe that the tariff should remain as it is.

Appreciation of Iron-Ore Values.

In view of the facts and considerations which have been stated in this article, I think there can be little doubt that while we are not likely to be on the eve of an iron-ore famine, and may experience but little real scarcity for some time to come, the tendency will be to appreciate the value of iron-ore properties. This is said, of course, on the same assumption that underlies all attempts to compute the future of the iron industry from the point of view of ore supply, namely, that the world's great deposits are already known. The point could hardly be better put than the MANUFACTURERS' RECORD put it in its article (page 129) of August 23, 1906, in stating that "owners of large bodies of ore, increasing intrinsically in value as rapidly as they must of necessity do under existing conditions, will not be willing to part with their ores except on the basis of very large increase of price."

New Uses for Iron and Steel.

To what extent is the demand for iron and steel likely to be increased by opening up new uses for iron and steel, as well as by the supply of the world's wants on existing lines? This is a problem that must greatly influence the situation. I should suppose that nearly one-half of all the steel produced in the world today is employed to satisfy uses that had no existence 30 years ago. Such uses include structural shapes of all kinds, shipbuilding materials of all kinds, railway rolling stock, many different descriptions of wire, segments for tunnelling underground railway lines, motor cars, and a multiplicity of others. It would be unreasonable to suppose that this movement will not be carried much farther in the near future. The substitution of steel for timber in the construction of structures of all kinds, including railway cars, must alone bring about an enormous multiplication of new uses. The use of steel for plateways has been much talked of, and is not unlikely to come about. Steel has also a manifest destiny on a much larger scale in bridge constructon, more particularly in the newer countries now awaiting development. It is hardly necessary to suggest that in the already established uses there is room for great expansion, and the progress of demand is likely to be large and rapid.

All this has been foreseen by the great iron industry of the United States, and hence the extraordinary progress of the means of production, including the substitution of the most modern for older and less up-to-date plants in many different centers. The figures collected and published from time to time by my friend Mr. Swank of the American Iron and Steel Association justify me, I think, in stating that the means of producing iron and steel in the United States have been doubled within little more than 12 years, and it is one of the most portentous signs of that development that the Steel Corporation has lately taken steps to construct a plant in Indiana with a capacity of 2,500,000 tons of steel, which will be operated almost entirely by electricity, and must presumably produce a good deal more cheaply than the older and more scattered plants which it is intended largely to displace.

The United States' Lead.

I should just like to digress here for a moment, in order to call attention to the fact that the United States, while it led the movement for more economical production by cheap freights, larger plants and improved methods and appliances generally, has not today the great lead that it enjoyed ten or even five years ago. In the interval European nations have made enormous advances, and while they are not today on the same all-round level as the United States, they are largely catching up with the best American practice. This is perhaps more generally true of Germany than of any other European country, but it is hardly less applicable to Great Britain, and both France and Belgium are more wide-awake than they have hitherto been. Nearly all the great steel works in Britain have been more or less remodeled, and the most up-to-date appliances are being more readily installed than formerly. As an indication of the recent trend of events, I may allude to the adoption of the Talbot open-hearth process by three important British firms, and the general raising of the efficiency of both blast-furnace and steel-works practice in Cleveland, Scotland, Wales and other leading districts. American iron men would not be well advised, therefore, if they held their competitors cheap.

Susquehanna Power Development and Navigation.

By HON. STEVENSON A. WILLIAMS.

[Written for the Manufacturers' Record.]

Those who know the Susquehanna from the map only are apt to think of it as a long river extending into three States, navigable only for five miles from its mouth and having a very extensive drainage area. The wonder is that such a river is navigable for so short a distance. Those who know the river by observation or in a business way are aware that for many years there existed an efficient canal system extending from Havre de Grace at its mouth to the junction of the north and west branches, and thence along each of said branches, as well as along its large tributary, the Juniata, in three directions northerly, easterly and westerly into central Pennsylvania, and to points distant from 150 to 200 miles from its mouth. This system of canals antedated railways, and was the result of nearly 50 years of persistent and intelligent effort and the expenditure of large sums of money by both Maryland and Pennsylvania, as well as by individual citizens of each State. They carried coal and other supplies from many sections of Pennsylvania to tidewater and vice versa. When the railroads were opened into the coal fields there came competition for freights on coal, and as the railroads bought coal lands and became more influential in the coal regions these freights were diverted from the canals, and, the revenues of the latter failing, they were no longer self-supporting. Finally the railroads obtained control of the canals, and as their influence with the State Legislatures was great, they either secured the passage of laws authorizing the abandonment of the canals, or, failing to repair them after freshets, submitted to foreclosure of the mortgages on the canal property. The beds of these canals are now dry or stagnant pools, and the 8 or 10 dams which were built at great expense for their protection are all washed out save one near where the Juniata empties into the river, which furnishes power to light Harrisburg.

About the year 1895 canal navigation on the Susquehanna ceased, and with it went the dream of those who for 100 years had been active in the movement for a great interior waterway and a navigable river. The charter of the "proprietors of the Susquehanna canal," granted by the General Assembly of Maryland just after peace with Great Britain in 1783, and the numerous supplements thereto and the charters under which the Susquehanna and Tidewater canals in Pennsylvania and Maryland were built from 1825 to 1838 show how earnest and determined was the effort to secure canal navigation of this river. In 1884 the General Assembly of Maryland compromised with the Philadelphia & Reading Railway debts due the State by the canal, thus making a last effort to preserve it as a highway. During this same session charter rights were granted to the Susquehanna Water-Power & Paper Co., and it seemed as though, after 100 years of effort for canal navigation and its failure, the people had concluded to permit the use of the river for power development and the erection of dams for that purpose. In 1896 and in 1900, when the final abandonment of the canal had become apparent, greater charter rights were given companies aiming at hydro-electric development.

The river bed for upwards of 60 miles above Port Deposit is a series of rocks and rapids. These are the obstacles to navigation which have rendered the building of canals necessary. While acts of Assembly constantly speak of the river as a public highway and navigable, it has always been understood that above Port Deposit it was only quasi-navigable down stream, and that no crafts ever passed over the river bed itself except lumber rafts which came down on the spring floods. It looks today as though the dream of the fathers for the navigation of this river is possible of accomplishment, not by canals as they were formerly planned, but by means of a series of dams for hydro-electric purposes and the formation thereby of long pools to be made to do the double duty of turning wheels and floating vessels.

The physical characteristics of the river which have prevented navigation make power development possible and practicable. There are many other streams or rivers where the development of an equal amount of power would be possible, but none where it could be so readily marketed. It is said that within a radius of 75 miles from McCall Ferry there is demand for over 1,000,000 horse-power. Today this demand is rapidly increasing in every quarter, and with greater accessibility and cheapening of power will increase many fold. The 500,000 horse-power that may be developed on 60 miles of this river will not begin to supply the demand, and there is not the slightest danger of a glut in the market. Already there is a plant operated at York Haven, 12 miles above York, which is supplying electric power for that city and vicinity. It has been in operation for a year. The dam at McCall Ferry will be upwards of 55 feet above the bottom of the river, forming a pool 8 or 10 miles back. Condemnation proceedings on behalf of the Susquehanna Power Co., a Maryland corporation, are in progress to secure the necessary rights to build a dam over 50 feet above the river bed at a point about one-half mile above Shures Landing, in Harford and Cecil counties. The pool back of this dam will extend nearly to the State line, and will leave a distance of 10 miles between it and the tail-water of McCall Ferry, over which a development is possible.

In this connection it is interesting to note that the pioneers in this power development were those who in 1883 began to build the Susquehanna Paper Mills, and their efforts were supplemented in 1896 by citizens of Baltimore who had the encouragement of the late John K. Cowen. Their studies of the river led them to the conviction that the distance from McCall Ferry to the tide water should be controlled by one development, and for many years their efforts were so directed, but before their plans materialized many of the necessary rights between McCall Ferry and Conowingo, Md., passed to the ownership of New Yorkers associated with Dr. Cary Hutchinson, who proceeded at once to make the development at McCall Ferry, leaving unused for the time being rights in Maryland above Conowingo and those between their dam in Pennsylvania and the State line. The Susquehanna Power Co. is a Maryland corporation which succeeded to the rights of the company which built the Susquehanna Paper Mills in 1883, and is now engaged in securing by condemnation the necessary land and rights in Maryland to build a dam and install a plant which will develop at least 50,000 horse-power.

The proposed changes in the method of utilizing the river have given rise to a number of interesting legal questions which are now being threshed out in the courts. The McCall Ferry people at first planned an 85-foot dam. The difficulty of procuring rights and the opposition of the Pennsylvania authorities are said to have reduced the height to 55 feet. The State of Pennsylvania, by Attorney-General Carson, has recently brought suit to compel the construction of a lock in the dam as well as a fishway, and to relieve the canal and its franchises from the lien of the mortgage given to secure a large bond issue, this latter upon the theory that the canal company by its charter is bound to maintain the canal, and that it cannot without legislative authority make a mortgage which might deprive it of power to perform its duties under its charter. The Susquehanna Power Co. proposes one or two locks in its dam, as navigation may require. It has expressed its intention of facilitating in every possible way either river or canal navigation, and doubtless the McCall Ferry company will do the same.

What is the probable meaning of this work to Baltimore and Maryland? Baltimore and Wilmington are nearly equidistant from the Maryland development. York, Lancaster, Harrisburg, Reading and other Pennsylvania towns are easily accessible to the Pennsylvania development. The impetus given all the active industries of these cities and towns would be very great. The experience of other power developments is that the use of the power at or near the source of supply is more profitable both to the seller and buyer. If this is correct, it is not merely probably that Baltimore city will thereby receive a great stimulus, but that the entire northeastern part of the State will have opened for it an era of prosperity which it has never before experienced.

So much for the power side of the question. How about the possibility of slack-water navigation and the restoration of facilities which existed while the canals were operated?

On this subject the Secretary of War in 1903 communicated with Congress, transmitting a report of the chief of engineers of an examination made of this river with a view to determining the practicability of improving it for purposes of navigation. The determination is against the advisability of such an undertaking by the United States Government on account of the great expense, but the practicability of navigation for boats of from 6 to 10 feet draft by means of movable dams is pointed out. With the advent of substantial dams for power development built by private enterprise the expense would be greatly reduced and the navigation improved to a much greater extent than by movable dams. At any rate, the tendency of events confirms the wisdom of the several acts of our Maryland General Assembly which permit the use of the river for power purposes. The distribution of electricity for light, power and transit purposes is a great public use, and when one of the possible results of such use is the restoration of canal navigation or its equivalent on the Susquehanna there can be no question as to the supreme importance of these works to the future of Baltimore, the Chesapeake bay trade and the entire northeastern section of the State.

Millions for Development in the Appalachian South.

[Special Correspondence Manufacturers' Record.]

Charleston, W. Va., January 1.

In taking a New Year survey of the Appalachian South—this remarkable section that contains most of the coal of the United States, practically all of the known iron ore in America outside of the Mesaba range, the largest bodies of standing timber east of the Mississippi river, and more streams with possibilities of water-power development than any other part of the Union—there is apparent an activity so diversified and so tremendous as to well-nigh challenge belief. Thinking in hundred millions, if not in billions, is necessary to measure the magnitude of the development as it appears today, and what it must grow into as the years go by is utterly beyond the grasp of the most imaginative mind.

John W. Gates recently told me in all seriousness that he saw no reason why Birmingham should not have 1,000,000 population 20 years hence. The entire Pittsburg district, with its enormous industrial activities—the greatest of their kind in the world—has scarcely so many people. Is there anyone who can at all realize what it would mean for not only the Appalachian South, but every portion of the Southland—yes, even the whole broad nation—if there should be a city of 1,000,000 population at Birmingham? Based on iron and steel manufacture, with anything like the magnitude of business and the vast fortunes that have come to those of the iron and steel interests in the Pittsburg district, such a development would be nothing short of revolutionary in character and effect; yet this prediction of Gates is based on logic—the cold logic of business, which points out that with proper equipment and management, furnaces in the Birmingham district can make iron cheaper by $2.50 to $3.50 a ton than it can be produced elsewhere in the United States, and $2 a ton cheaper than it can be produced anywhere else in the world. The fact that the Gates companies—the Tennessee and the Republic—are spending some $10,000,000 in the improvement of ore and coal mines, coke ovens, furnaces and mills may be taken as a demonstration of the faith that is in their directors. It is a step in the direction of bringing about the development predicted. In its advertisement of conditions and possibilities it is of even stronger significance, and unquestionably this opinion of Gates and these vast expenditures by the Gates companies will have a powerful influence in attracting the world's attention in such a manner as will immensely benefit the Birmingham district and stimulate development in a marvelous way. Important as is this development in the lower Appalachian South, it is only one of the forces at work to make the district great. Gates estimates that his companies have 1,000,000,000 tons of iron ore in the South. The other companies in the Alabama district have holdings of probably as much more, and such enterprises as those of the Alabama Consolidated, the Sloss-Sheffield, the Southern Steel Co. and others are also busy with plans for an increased output and a greater diversity of product, so that an era of progress, with many forces working toward the same end, seems to have begun in the Birmingham district, such as will make everything done heretofore appear as the most primitive of pioneering, and such as will go far toward fulfilling Gates' prophecy, even if the full measure of the growth predicted may not be entirely realized.

Though the center of the greatest iron and steel development in the South today, and by these prophecies of Gates, and others, too, destined to keep the lead attained, yet outside of Birmingham in numerous cities of the Appalachian range there is a development in the manufacture of iron and steel products that denotes a steady and permanent advance in manufactures of this kind. What Pennsylvania has done in a manufacturing way West Virginia is beginning to undertake. Wheeling, with its iron and steel, its glass and varied industries, is so much an overflow of the Pittsburg industrial activity that right now a practically continuous city from the Monongahela to the Muskingum is often predicted. At Charleston there are such important steel works as the Kelly Axe Factory, making almost a third of all the axes of the world, and the Baldwin Steel Co., coming to Charleston from New York, is completing an immense plant for the manufacture of the best high-speed tool steel made in the country today. Huntington, where are the great car shops of the Chesapeake & Ohio Railroad, a branch of the American Car & Foundry Co. and a recently-located branch of the Abendroths of New York, is also becoming a place of importance as an iron and steel manufacturing center; and thus down the Appalachian range, from the Potomac to the Warrior, there is development in all lines of iron-ore mining, iron and steel production and refinements of manufacture wherever ore is found and wherever fuel and transportation conditions justify activity. Railroads are being built to open up iron-ore deposits in Southwest Virginia and elsewhere; old furnaces are being re-equipped and enlarged, new industries are being started at Bristol, Knoxville, Chattanooga and numerous other places, and altogether fully $25,000,000 is being spent in the Appalachian South right now on the development of ore properties, coke ovens, furnaces, mills, finishing plants and the establishment of industries to manufacture the products of the iron and steel plants.

While the utilization of coal for power for factories at home, to an extent more nearly approaching the conditions in Pennsylvania, may well be regarded as a consummation devoutly to be wished, it is doubtless true that many decades must go by before the coal-producing States of the Appalachian South will be justified in refusing to sell coal to the world at large on account of the demands at home. So to get these coals to market some of the most gigantic railroad construction enterprises ever known are under way, all of them having as their primary object the transportation of the coals of the Appalachian South. In West Virginia, where the coal production has jumped to 42,000,000 tons in 1906, making West Virginia second only to Pennsylvania as a coal-producing State, there is not only the $50,000,000 Deepwater-Tidewater Railroad under construction from the heart of the Kanawha, New River and Pocahontas fields, to Norfolk, with ultimate intentions to push on from West Virginia to the Lakes, but important and expensive double-tracking operations are being put through by the Chesapeake & Ohio and Norfolk & Western roads; the Coal River branch of the Chesapeake & Ohio is under construction; the Coal & Coke road of Senator Davis and associates is already in operation; Senator Elkins' Morgantown & Kingwood road is developing another section; the Blue Creek road of ex-Governor MacCorkle and associates is in partial operation, and facilities are being provided that with adequate equipment of cars would enable West Virginia coal mines to double the output of today.

Over in Appalachian Kentucky railroad extensions by the Chesapeake & Ohio have made possible the development of the Elkhorn coking and steam coals for the first time in their history, and operations under way on the property of the Big Sandy Company will give an output from that field of 6000 tons a day. There is renewed talk of a line to be built from the Ohio river to develop the vast holdings of the Northern Coal & Coke Co. in the Elkhorn field, and other Eastern Kentucky

coal fields are promised lines required for their development.

To reach Southwest Virginia the South & Western is being built to the Breaks of the Big Sandy, to a junction with the Big Sandy branch of the Chesapeake & Ohio, and southward to a junction with the Seaboard Air Line near Rutherfordton, and with other Southern roads at Spartanburg. This $30,000,000 enterprise, the property of the Blair-Ryan syndicate of New York, is, like H. H. Rogers' Deepwater-Tidewater, being built with almost sole reference to its fitness as a line over which the coals of the Appalachian South may be most cheaply hauled to the markets of the interior South and to the seaboard.

The Southern Railway, through the purchase of McHarg's Virginia & Southwestern, is put in touch with the coal fields of Southwestern Virginia as never before, and many additional millions are being spent by that road on its Knoxville division and elsewhere in the construction of double tracks and extensions, so that it may be in better condition to handle the enormously increasing tonnage of the coal fields in the section of the Appalachian South which it penetrates.

So, too, has the Louisville & Nashville expended millions in new trackage in this section. The Seaboard Air Line some time ago pushed on into Birmingham, and a new enterprise which will call for an expenditure of $20,000,000 in addition to the original investment in section of the road already completed is the Atlanta, Birmingham & Atlantic, to reach ultimately from the coal and iron fields of the Birmingham district to the seaboard at Brunswick.

In the absence of exact figures as to the cost of improvements now in hand in the way of railroad building, old and new, having as a prime incentive to construction the handling of the coals of the Appalachian South, it is easily within conservative bounds to place the total at $150,000,000.

While much of this enormous expenditure represents the perfecting of facilities for getting fuel out of the Appalachian South for the benefit of other sections, nearby and remote, another great development in this section of the South is important and significant of present conditions, in that it is for the benefit of immediately adjacent points. This is the hydro-electric development which has been undertaken on so extensive a scale in recent years. In North and South Carolina, Tennessee, Georgia and Alabama all of $30,000,000 is being expended today on enterprises of this sort, and probably $20,000,000 more will soon be added by new enterprises now being worked up. On the Yadkin is the Whitney & Stephenson development, contemplating an ultimate expenditure by these Pittsburg interests of some $7,000,000, and other proposed developments on the same river will require almost as great an amount. The Southern Power Co. of Charlotte, with New York and Southern money at its back, is spending something like $10,000,000 in the development of a dozen water-powers on the Catawba and tributaries; Chattanooga men are putting $4,000,000 or $5,000,000 into the work of harnessing the Tennessee near that city; millions have been spent in developing the water-powers of the Chattahoochee at and near Columbus, Ga., and the work is still under way; the Calhoun Falls of the Savannah are to be developed by Pat Calhoun and associates; near Atlanta millions have been put into the development of nearly 100,000 horse-power in the aggregate, another 100,000 horse-power is to be developed at Muscle Shoals in the Tennessee river in Alabama, and numerous lesser developments, like those at Asheville and elsewhere, have also recently been put in, while many other projects of the kind of greater or less extent are in process of formation or financing. With something more than 500,000 horse-power thus added to the resources of the section, power that is available every day throughout every year, a new development of the industrial activities of the Appalachian South is certain to occur, immensely adding to the wealth and population of all the cities and towns to which this power may be supplied.

Timber operations, woodworking and industries in these lines are at least of secondary importance in all of the States of the Appalachian South. Throughout all this heavily-wooded section there is a tremendous activity on the part of sawmill men, as well as a notable development in industries which work up the product of the mills into finished forms. From West Virginia all down the line to Alabama and beyond timber tracts are in strong demand at almost continually increasing prices. Pennsylvania, New York, Ohio and Michigan lumber men are coming in in increasing numbers, and are buying for present operations and future needs. In West Virginia so many Pennsylvania timber men are operating along one branch line of road that the whole line has been given the name of "Pennsylvania Avenue." New towns are springing up where these operations are going on, some of them now cities of several thousand population, where there were nothing but woods a year or two ago.

Some conception may be formed of the operations in these lines by reference to the census bulletins of 1905, but where the changes of a few months or days bring an entirely new condition, both as to values of property and extent of enterprises, only an approximate idea can be gained of the present-day situation. Statistical figures, on the other hand, are wholly inadequate as giving the faintest conception of investments made by outsiders in the timber lands of this section, or of the increasing values of property of this kind. Such information, up to date and complete, is not available at all without practically a mill-to-mill canvass. In West Virginia the past two years have seen an enormous advance in values of timber tracts, and to a greater or less extent the same holds good throughout the entire South Appalachian range. Some individual cases will illuminate this point. In Randolph county, West Virginia, where there has been a great development in the spruce and hemlock milling industry, following the extension of railroad lines, lands that sold at $4 and $5 an acre a few years ago have recently brought from $40 to $60, and one tract of 1500 acres that sold at $12,000 two years ago has just been resold for $100,000. These values are based not alone on acquired transportation facilities, but on the increased prices that timber brings, so that latest purchasers frequently figure that tracts at present-day prices show a greater true value than they did at the cheap prices of a few years ago.

It is public information that at least some measure of this same activity prevails throughout the entire Appalachian South, and United States census figures give added proof. The 1905 bulletin reports are to the effect that in round numbers $91,500,000 is invested in sawmill operations in the eight South Appalachian States of West Virginia, Virginia, Kentucky, Tennessee, North and South Carolina, Georgia and Alabama, with a lumber and timber product valued for the year reported on of $118,000,000 in round numbers. In all of these States except West Virginia and Alabama lumber and timber products come second in the list of leading industries of the State. In Alabama it is third, being exceeded by iron and steel and cotton goods, in the order named. In West Virginia it is first.

As elaborated on heretofore, the census reports can give small idea of present-day values of timber investments, and it is certain that a large increase in the value of the output of lumber and timber has occurred since the census figures were compiled.

No attempt is made in this letter to give the figures on the manufactured products of lumber. The statistics I give here do not include even the operations of planing mills, and only the merest mention of the development of woodworking establishments, furniture factories, etc., will be made. That there has been a tremendous development in all industries in this line a stay in any of the cities of the Appalachian South will readily disclose. While it is true that a vast preponderance of all the timber sawed in the South still finds its way to the factories of the North and East, yet there is so constant an increase in the number of furniture and other woodworking industries that hardly a copy of the MANUFACTURERS' RECORD can be picked up that does not contain a mention of some enterprise of the kind as having been established in the States of the Appalachian South. In some instances whole prosperous communities have been built up on furniture-factory operations alone, and all the way from Wheeling to Birmingham the importance of the industrial development has been immensely augmented by the establishment of new woodworking plants and the enlargement of old ones.

The Appalachian South is rich in such a diversity of resources that at least passing reference should be made to the precious metals of North Carolina and Georgia in particular; the many varieties of marble in the South Appalachian States, including the white statuary marbles of Alabama, which exceed in purity and beauty the famed products of Carrara; the fine gray granite of North and South Carolina and Georgia, and oolitic limestone, which is attracting extensive investment by Northern capital in Portland cement plants in many points of the Appalachian South.

As a fertile mother of prosperity the Mississippi valley is the queen of the world. With its remarkable diversity of resources in coal, oil, gas, iron, timber, stone, metals and water-powers, may not the Appalachian range, the great backbone of the Eastern Continent, some day become famed as the most wonderfully productive and industrially active section the globe contains?

ALBERT PHENIS.

THE COTTONSEED AND ITS MANY PRODUCTS.

By L. A. RANSOM, Atlanta,
District Manager Southern Cotton Oil Co.

[Written for the Manufacturers' Record.]

"If the United States had, 20 or 25 years ago, followed up the admissions of European olive-oil experts, that they could not detect one-third cottonseed oil in their best olive oil, and pushed the matter to its just conclusion, viz., that cottonseed oil was as pure and wholesome—although in itself lacking the peculiar flavor of olive oil—as the best olive oil, the United States would not today be able to meet the foreign demand which would have been created therefor."

"The fact that Germany, Denmark and the United Kingdom import over $12,000,000 worth of United States cottonseed oilcake is evidence enough as to its worth, for they are the expert cattle feeders of the world."

The two paragraphs quoted above are from the Daily Consular and Trade Reports of the United States Department of Commerce and Labor, October 9, 1906, and no other evidence is needed to prove the value of these two chief products of the cottonseed industry of the South, nor is further evidence needed regarding the importance of the foreign trade in these two products, except to state the actual figures as shown by the same report.

The total value of the oil exported for the year ending June 30, 1905, was $13,673,400, lard substitutes (compounded with cottonseed oil) $4,154,200. The exports of cottonseed oilcake amounted in value to $13,073,400, and of linters to $1,433,925, making the total exports of cottonseed products, exclusive of the oil exported in oleomargarine, $32,334,925.

Discussing the extensive admixture of cottonseed oil with olive oil in foreign countries, and the admissions of experts that the mixture could not be detected, the Government Bulletin continues:

"Then the question assumed national importance, for if the cottonseed oil had such 'affinity' for olive oil as to pass the most expert connoisseurs when properly mixed, the whole olive-oil industry of Italy seemed menaced. The Government therefore sought, by a 'prohibitory tax,' to exclude the imports of the oil. But the 'prohibitory tax' has had, seemingly, no effect whatever, for the imports of cottonseed oil into Italy in 1905 were many times greater than in 1880. The same is true of the other olive-oil-producing countries.

"The largest export of cottonseed oil is to the Netherlands ($4,089,600 in 1905), where it is used in the manufacture of margarine, of which the United Kingdom purchased about $13,000,000 worth in 1905. All this is not intended to find fault with the Old World for its uses of our cottonseed oil for mixing and manufacturing (it is the very purest and most wholesome product for such purposes), but to draw the attention of American consumers thereto. Undoubtedly a large proportion of the olive oil imported into the United States is composed of that cottonseed oil which the American people refuse to consume in its honest form, but consume when imported under the several well-known brands of the Old World's famous olive oils."

It may be some time before the South monopolizes cotton manufacture, but natural conditions, followed by mechanical ingenuity and commercial activity, have already established a monopoly in the South in the manufacture of high-grade cottonseed products.

The cottonseed industry of the South is unique, because it is "alone of its kind," especially when the diversified interests concerned in it are considered.

Its history is interesting; its development as sensational as the California gold discovery of '49. Its only setback and the greatest financial danger it has encountered thus far has been its too rapid growth, markets declining on account of overproduction and crushing capacity exceeding the supply of the raw material at prices that the producers could pay for seed on the market value for the oil, and this danger might have been averted, as has been shown, if those interested in it 20 years ago had made the proper effort at that time to push the sale and use of the oil in foreign countries.

So rapid was the increase in the number of crude mills in a few years that refiners did not find satisfactory markets for the

finished products, cooking oils and compounds, as fast as the production of crude oil increased; consequently, the mills were forced to depend largely on the limited number of European buyers to take their surplus refined oil, and these buyers knew well how to buy on congested markets. This has resulted in some years in serious loss to the entire industry, refiners and manufacturers of crude oil as well. This condition seems to have passed, at least it has improved, and while the profits have averaged less than the average profits of other manufacturing establishments, particularly in recent years, more stable conditions seem to have been reached and better, broader and sounder judgment displayed in the handling of the business.

Until about six years ago the producers of crude oil depended largely on Eastern and Western refiners for their markets. About half of the oil was then, 1900, exported after being refined out of a total estimated production of 1,500,000 barrels. In 1900 a large number of crude-oil mills were purchased by Southern refiners, and then followed an increased production of the finished products and an increased domestic and home use of the products. In 1905 only about one-third of the oil was exported, against one-half in 1900, although the total estimated production had increased to about 3,000,000 barrels, making the domestic consumption about 2,000,000 barrels, against 900,000 barrels in 1900, thus doubling the home demand for it. This increase in the home use of oil gave a tremendous impulse to the manufacture of crude oil, and in the two years following the number of mills in the South almost doubled.

The increased use of the oil by Southern manufacturers of finished products strengthened both foreign and domestic demands for it, the development running on much the same lines as the result following the increased manufacture of cotton by Southern factories. It has been further helped by the general prosperity of the country in all lines of manufacture, the improvement in agricultural conditions and the better buying ability of the people generally. If the mistakes of the past are not repeated, if production is allowed to run parallel with consumption, the demand for all cottonseed products will soon enhance the values and the industry will enjoy the same degree of prosperity that has come to all other manufacturing enterprises.

Commercially, the industry originated in New Orleans about 1855. Its immediate development was checked by the war, 1860-65, and was of little commercial importance until 1880, at which time there was in operation in the South 48 crude mills and one refinery at Providence, R. I. In 1905 the census report showed a total of 715 establishments, refineries and crude mills in the United States, representing a capital of $73,000,000 and value of products $98,000,000.

The products of this industry compete with the olive growers of Italy, Spain and France, with the producers of copra of the Pacific islands, with the cocoanut, peanut and sesame oil manufacturers of Europe, with the packers of the world, with the butter-makers of Europe, with the Western growers of corn and hay, with the hog-raisers of the same section, and in a limited way with the European growers of low-grade cotton and cotton-factory waste. They also compete with the manufacturers of soap of all kinds, wherever located. Not only do the products of the cottonseed mills and refineries compete in foreign markets with the commodities mentioned produced in those sections, but they also are forced to meet the competition of American manufacturers and producers of similar commodities in foreign and domestic markets. It is not surprising, therefore, that the development of this industry has been retarded because it met with so much opposition from so many different and conflicting interests.

The Interstate Cottonseed Crushers' Association, through its publicity bureau, is trying to correct the mistakes and injury done the industry 25 years ago by failure to take advantage of foreign markets, as explained in the consular reports referred to, by more fully advertising these products and thus creating a greater demand abroad and at home, which would already have existed if the proper course had been followed by those controlling the industry in its early history. In this work the publicity committee is receiving the cordial co-operation of the Bureau of Manufacturers, Department of Commerce and Labor, at Washington, D. C., the assistance of the trade journals and the newspapers generally throughout the United States and of the members of the association. It is believed that a better knowledge of the value of these products will not only increase the demand, but will result in more remunerative prices to both refiners and crude-oil mills.

A recent report of the Bureau of Statistics, Department of Commerce and Labor, says: "The value of cottonseed oil as a food product was not known in the early days of its manufacture. In 1881 it was discovered that cottonseed oil mixed with animal fats made an acceptable substitute for lard. From that time the domestic demand greatly increased. In 1880 about 30 per cent. of the cottonseed oil manufactured in the United States was consumed at home, while in 1905 it amounted to 60 per cent."

It has also been "discovered" that the oil in its natural state is a satisfactory substitute for lard and other animal fats. The demand for it as a cooking commodity is increasing daily. Its purity and wholesomeness is attested by the chemists, and practical experience supports the expert testimony.

Recently a great deal of interest has been aroused on account of an address delivered by Professor Connell on the value of cottonseed meal as a human food, and competent authorities have announced that this is entirely practicable, and that we may expect a large addition from this source to the food products of America.

For 150 years mills for crushing cottonseed have been operated in Europe, but the differences in the character of the products of these mills and those of the South are almost as great as the differences between woolen and cotton goods.

In the South the seed are worked directly from the fields; in Europe they are transported from Egypt and America, reaching the mills many months after shipment. The products are necessarily inferior to those of Southern mills. The manufacturing methods, too, are not the same. In China, for possibly 2000 years, oil has been expressed from cottonseed, and is still produced by primitive processes; consequently, it also is far inferior to the Southern product.

The Southern industry is, therefore, unique, in that it "stands alone" in its methods of manufacture and in the quality of its product. It is just as complete a monopoly of its kind as the American production of Sea Island cotton. The feeding and fertilizing value of the meal produced in the Southern mills is just about double that of the same commodity manufactured in the English mills. The world looks to America, therefore, for its high-grade cottonseed oil and high-grade cottonseed meal. But with all these advantages the South does not derive the full benefit from the business, because a large part of the total annual production of the cake or meal goes to foreign markets. Probably half of the linters (short fiber) is also exported. The meal and hulls are needed for stock food, in order to increase the number of beef cattle, milk cows and hogs in the South. In no other way can packing-houses be so successfully established and the dairy products increased in this section as by the use of cottonseed meal and hulls. When all of the cake or meal and all of the linters are used where produced—and that now seems probable in the near future—the full benefit of the industry will be realized by the people who own it and by those who grow the seed.

The total production of cake or meal is about sufficient to feed more than 1,000,000 head of beef and dairy cattle the year round, while the hulls would supply roughage for 250,000 cattle for one year. If 1,000,000 head of cattle were fed on the meal and hulls and the deficiency in roughage supplied by native grasses and hay, then the hulls and meal would supply 1,000,000 cattle for the entire year. As fattening cattle are usually kept for only about six months on food of this sort before being marketed, the supply of meal and hulls, supplemented with native grasses and hay, would supply 2,000,000 head of beef cattle for that time. Such a use of these products would create packing-houses throughout the South and add another important industry to this section that would be of immense benefit to the whole people.

All of the hulls are now fed in the South to beef and dairy cattle, but a large part of the meal is exported or used in the manufacture of commercial fertilizers. This partial loss to the South of the most valuable feedstuff produced in any country shows a lack of appreciation and of enterprise that should not exist and will not continue many years, as the value of the meal for feeding purposes is better known each year.

The industry has had to combat the prejudices of its own people and the opposition of every competitor in every market of the world. Sometimes the national government of its own country, and even the governments of its own States, have been arrayed against it. The manufacturers of lard first opposed its chief product and were followed by the butter-makers of the West, while the French, German, Austrian and Italian Governments tried to prohibit by high tariffs the sale of the oil in their own countries, but seem to have succeeded only in increasing its use. In spite of prejudice, opposition and imposition at home and abroad, the high merits of cottonseed oil carried it through all these difficulties, and today the demand for it is better than at any time in its history, while the use of the meal and hulls has about doubled in six years.

So that the industry seems to have overcome all opposition triumphantly and has worthily won the world's recognition as one of the great manufacturing interests of the country, and wears its honors becomingly.

In the further development of the industry the trend is Southward, where the cotton grows. Here the crude oil is produced, here it can be refined while it is sweet and pure, fresh from the fields and the seed. With the establishment of commercial exchanges in the leading Southern cities and the coming of immigrant ships direct to Southern ports the trade with Europe will naturally come this way, and this will lead foreign dealers and brokers to look to Southern producers of finished products for their supplies.

MISSOURI'S GREAT ZINC AND LEAD MINES

By S. F. B. Morse.

[Written for the Manufacturers' Record.]

In the southwest corner of the State of Missouri is one of the most important and busiest wealth-producing mining and agricultural sections of the United States, if not of the world. Jasper county, Missouri, has for years contributed more than a fair share to the commercial upbuilding of the entire country, until, with a steady increase of productive wealth derived from its own phenomenal natural resources both above and beneath the surface of the land, it ranks second to none as a promoter of national prosperity.

With climate, season and soil annually forcing nature's most bountiful yield of all products of the temperate zone from cotton to corn, the Jasper county farmer is the personification of independence, and looks not with the least envious eye upon the follower of agricultural pursuits in other sections of the glorious West. It is literally from beneath this fertile soil that fortune-favored Jasper county derives its greatest wealth, and this, too, within a radius of approximately 25 miles of a given center. Within this limited area the hum of industry incident to the day and night operations of some 400 concentrating plants bringing to the surface and treating zinc and lead bearing dirt reverberates throughout the world. There is not the romantic glamor surrounding zinc and lead mining which pertains to the more precious metals—gold and silver—but the demands of commerce, invention, manufacture and transportation have encircled these lesser metals with an importance which is best evidenced by the persistent and almost continuous advance in price for the past 15 to 20 years, until the ore values of this single mining district for the year 1906 just closing will equal, if not exceed, in zinc $12,000,000, lead $3,000,000, or a total of $15,000,000.

Fifty years ago Carthage, the county-seat of Jasper county, was a village; Joplin, Webb City and Carterville but mining camps; today, with beautiful roads, electric trolley lines and railways covering a distance of about 19 miles and affording an easy and rapid means of communication between cities and mines, the first visit of the stranger is replete with wonder and amazement at the hustle and thrift of the people, the evidences of prosperity in the imposing business blocks, large wholesale and retail establishments, manufacturing enterprises, big hotels, the great number of beautiful residences, schools, banks, etc., of which each city has its share, while the innumerable smokestacks, elevators, mills, mountains of tailings hovering around the outskirts of each commercial center as viewed from trolley or railroad indelibly impresses the mind not only with the present marvelous industry and development, but the future exceptional possibilities of the district.

Joplin, with its 40,000 population, is the leading commercial, financial and mining center of the Southwest Missouri mineral belt; Webb City, Carterville, Duenweg and Porto Rico, a combined population of about 18,000, lying northeast 10 miles from Joplin, are the largest producers in ore values, while Carthage, with 12,000 population, the county-seat, nine miles northeast from Webb City, is reputed to be the most beautiful and healthful city of its size in the United States. Its courthouse, schools and other public buildings, magnificent residences, broad

driveways and well-paved streets and parks are the pride of every loyal Missourian and excite the praise and wonder of every visitor. It is tritely said, here, indeed, are the veritable "Jack-built houses." Ohio, Pennsylvania, New York and New England have contributed liberally to the population, and few are the citizens, high or low, the foundation of whose contentment today cannot be traced to holding "Jack" at a time when the fortune-seeking game was far more trying, hazardous and uncertain.

The existence of lead in Missouri was known to the early French and Spanish settlers of the Mississippi valley, but mining was confined to the southeastern portion of the State. In 1848, according to one report, lead mining in Southwest Missouri was first begun by William Tingle, who found lead two miles east of Joplin, and the decade 1850 to 1860 marked the birth of the mining industry in Southwest Missouri. In about 1851 mining was begun on Center creek, near what is now known as Oronogo, but the Civil War crippled mining operations to such an extent that it was not until 1870, when John Sargent and E. R. Moffett discovered lead ores in large quantities within what are now the city limits of Joplin, that mining began in real earnest.

For a long time mining was confined entirely to lead only, which was often found by itself in paying quantities, but more frequently found closely affiliated with the zinc ore.

At first it was not known by those engaged in mining in this district that this zinc, commonly called "Jack," had any value, but when its usefulness first became recognized it was culled from the dump piles in large quantities and sold for from $6 to $7 per ton. From this time on zinc became an important factor in mining, and with a gradual increase in the price of zinc ore, due to a corresponding increase in the usages of metallic zinc, it became profitable to mine for zinc alone.

Since 1901 there has been a further rapid and continuous upward tendency in the value of these important metals, due entirely to demand created by the widening and increasing uses thereof and the failure of the production of the high-grade ores (practically confined to the Southwestern Missouri mineral field) to keep up with the immediate requirements of consumption. This is particularly true of lead, which has fallen greatly behind domestic consumption, and which condition, in turn, has forced importation. Indeed, it is authoritatively claimed that no new and important lead deposit has been brought to light in the United States during the past 12 years.

Lead enters into the manufacture of paints, oilcloth, rubber goods, telephone cables, printing type, pewter, solder, plumbers' supplies of various descriptions and all articles where non-corrosive metal is an essential; also numerous chemical and medicinal products, to say nothing of cannon, gun, rifle and revolver ammunition, and electrical appliances, conductors, batteries, etc.

The average individual will quickly describe the commercial uses and values of gold, silver, copper, iron, coal, etc., but ask him what zinc is used for and he will probably stop at washboards, bathtubs and the commonly-called "zinc," a sheet used under the kitchen or hall stove as a floor protection against fire or heat. Space forbids the full list, but sufficient is said when it is explained that zinc today is extensively used in preventing wear and tear on boilers, in the manufacture of nails, metal shingles, roofing, ornamental ceilings, moldings and castings, water and oil tanks, bath and wash tubs, washboards, linings for refrigerators, netting, screens, toys, wire, printing plates, engravings, bronze, galvanized-iron and brass products. Fifty-eight per cent. of the zinc produced enters into the manufacture of galvanized iron, 25 per cent. into brass products. Two million five hundred thousand pounds of zinc spelter has been consumed this year alone in the production of the common domestic "pin" and 17 per cent. into fine arts. Zinc paint for interior finishing is fast encroaching upon white lead. Zinc is indispensable to the cyanide process of gold extraction and also for the desilverization of lead.

The world's supply of tin is being rapidly exhausted, and zinc is the only metal offering a substitute therefor. These facts, together with the ever and phenomenally increasing requirements of electrical expansion, compels the conviction that the price of zinc must continue to rise not only in sympathy with copper and lead, with which it is so closely affiliated, but immeasurably so upon its own merit and importance in other commercial directions.

With respect to electrical expansion, experts predict that that field alone during the next 25 years will create a market for every surplus pound of zinc produced in the United States. The requirements of electricity are greater today than the entire production of the district only a few years ago. The natural result is that zinc concentrates have, as heretofore stated, increased steadily in value since the days when it was not appreciated and sold at $6 to $7 a ton until today when it has a firmly-established value of $50 per ton, ranging as high as $60. The lead, which is found in paying quantities in connection with zinc mining, is now selling at from $80 to $90 per ton, but on account of the uniform deposits of the zinc greater attention is paid to zinc mining, and lead is considered a by-product.

The growing importance of zinc has brought about rapid changes in the mining operations of the mineral belt, and although it is still known and invariably described as the Joplin district, in reality for several years past the big ore turn-ins have come from the newer camps. The mines which gave the pioneer Joplin district its name were usually of shallow pocket formations of lead, with zinc predominating. As a result, mining was very largely speculative. This pocket or chimney formation was to such a degree so uncertain that even after a strike was made the area or extent of the deposit was not apparent; hence in many instances a mine making $1000 a day for a week might, and, in fact, did, frequently become exhausted within a month.

Large bodies of pocket ore were discovered here and there and vast fortunes were made from a single mine. When a prospector would strike it rich a fortune awaited him. In one instance $1,600,000 worth of ore was taken from a single acre. Many prospectors, however, failed to make a strike for the reason there were no regular surface indications to mark the extent or the whereabouts of a deposit. Prospect drills were not in vogue and all prospecting was done by shaft sinking, which was very expensive.

Occasionally companies were organized or promoted and capitalized at a figure which might be fully justified in case the ore deposit was of sufficient extent to insure the continuous operation of the mine or mines for a term of years. Many of these companies were successful, but many, on the contrary, where the ore was worked out while the company was yet young, were failures, and in this way the reputation of the old Joplin district suffered to some extent, as has been the case in nearly every other mining camp of importance in the country.

In recent years the increased price of ore warranting improved machinery, and the discovery of a uniform sheet deposit of ore covering several square miles of territory in the Webb City-Porto Rico-Duenweg district, has justified mining operations on a much more extensive scale. Hand jigs of the early days are still to be seen around Joplin, and 75 to 100-ton mills are a common sight, but today in the newer camps above referred to 250-ton mills are becoming common, and there are several ranging in capacity from 500 to 1000 tons of rough dirt per day.

Large investors have come into the field. The value of land in the sheet-ground district runs in many instances to thousands of dollars per acre. Operators are now justified in investing $50,000 or even $100,000 in a single mill, as it is possible under modern conditions to test the extent and richness of the deposit by means of drills in advance of the sinking of shafts and the erection of mills. The operator of today knows what it costs to mine dirt and put it into the hopper as accurately as the flour miller knows what it will cost to put wheat into the elevator. The cost of milling is also figured to a fraction of a cent; hence the value of the finished product can be calculated as certainly as the selling price of a barrel of flour.

While even yet sufficient prospecting has not been done to determine the extent of this sheet-ground deposit, it is a pretty well-accepted fact that the ore body, which was first discovered within a mile and a half to the northwest of Webb City, where the Yellow Dog mine, the Newell-Morse and the Guinn land are located, runs in a southeasterly direction, apparently culminating in what is known as the Porto Rico-Duenweg district, about four miles distant.

The richest part of this sheet-ore deposit appears to be both the northwest and southeast extremities, and here it has been proven up in width to the extent of about two miles. In some places in the course of the apparent run it seems to narrow down considerably. When more prospecting is done the exact extent and boundaries will undoubtedly be located, but as yet the sheet-ground prospecting might almost be said to be in its infancy.

In the Porto Rico district a single 80-acre tract is held at $800,000, and this tract is paying to the owner in royalty over $100,000 per year.

Adjoining the same is the Trinity tract, and as an illustration of the uniform richness of this 120 acres, in 38 drill holes sunk an average face of 20 feet of ore was shown in every hole.

As an evidence of marked development in this district, 18 months ago only five mills of a small type were in operation. Within the past year over 100 drill holes have been sunk into ore within a radius of one mile. Over 20 shafts have been sunk to ore and 20 more are being put down at this time. Ten new mills have been erected and are in operation, and 15 more, all with a daily capacity of from 300 to 500 tons, are under construction, six of which are being erected by the Cathedral Mining & Smelting Co., fostered by Eastern and New England capital.

In the Webb City section of this sheet deposit there are now over 25 mills in operation. Several new ones are now being built, and active development in this neighborhood dates back to only three or four years ago.

Webb City is not only the center of this large sheet-ore district, but is now the geographical center of the entire Southwest Missouri field, and the mines within three miles of this thriving city produce 100 per cent. more ore than all the mines in the old Joplin district combined.

The reason that this Webb City district has taken pre-eminence over Joplin is not only on account of this uniform sheet deposit, which has eliminated speculation from mining in this field and placed it on the same basis as a New England manufacturing concern, thus justifying the capitalist in investing extensively, but because of the greater affiliation of the lead with the zinc.

To be mining for zinc at $50 a ton and be taking out daily as a by-product several tons of lead at a value of from $80 to $90 per ton is very attractive to capital, to say the least.

This sheet ground is so uniform that by the sinking of drill holes the approximate value of the deposit under a given area can be determined. There speculation ends, and the amount of profits from that time on depends upon the management. The more economical, thrifty and businesslike the administration the greater the profits.

So great has been the development of this sheet-ground district during the past year that already the basis selling price of ore is fixed on not what it costs to produce the ore in some of the shallow or soft ground mines of the Joplin district, but what it costs to produce ore in the Webb City sheet-ground district. It is confidently asserted that prices can never go so low that mining in this district will be unprofitable, because if they did so the output of the district would be curtailed 75 per cent., which would not leave enough ore to keep one-fourth of the smelters in operation.

The ore is purchased in the bins at the mill by the buyers representing the smelters. These buyers visit all mills weekly and make their bids. They load all ore on the cars at their own expense.

The demand for ore is increasing daily, and although there is a reasonable profit in sheet-ground mining at $40 or even $35 per ton, it is predicted that zinc ore will inside of the next two years sell as readily at $60 per ton as it does now for $50.

As stated in the beginning of this article, while this great but comparatively obscure mineral region has for years annually contributed millions of dollars to the productive wealth of the whole country, it can truthfully be said to be just entering its bonanza age, in which large capital will find security and abundant profit. To be conservative, however, in the opinion of the best judges, it should be invested in sheet-ground mining, where land already prospected and proven can be leased on a royalty basis or purchased outright. By following such a course the element of chance is eliminated as much so as it is from any legitimate field of manufacture.

BIG PLANT FOR NORFOLK.

Branch of United States Wood Preserving Co. of New York.

An important addition to the manufacturing interests of Norfolk, Va., and vicinity is announced as to be established at Money Point. This plant will be built by the United States Wood Preserving Co. of 29 Broadway, New York city, which now has a large plant in New Jersey. The company manufactures wood blocks for paving, large quantities of which are now being used throughout the country, and the demand for which is increasing. It will use large quantities of the gum timber grown in the Great Dismal Swamp, and is reported as at present consuming from 2,000,000 to 3,000,000 feet of timber every month. The gum will be sawn into blocks, which are filled with creosote oil and then shipped to the cities where paving is to be undertaken. It is reported that the Norfolk plant will represent the investment of approximately $500,000. A 10-acre site on the Elizabeth river is to be occupied by the plant.

Growth of Southern Factory Diversification

By Edward Ingle.

[Written for the Manufacturers' Record.]

Of the 339 separate kinds of industries within the scope of the 1905 census of manufactures, 262 are represented in the 14 Southern States. That exhibit will probably surprise many persons who have been accustomed to view manufacturing in the South, in comparison with the rest of the country, as something just beginning to evolve and as concerned chiefly with the primary handling of the raw material upon which a vast range of manipulations is based. But the figures show that the South is using, in ever-increasing quantities and to greater and greater wealth-producing effect, many forms of secondary and tertiary products of cotton, iron, lumber, leather, phosphate rock, clays and other minerals. They show such materials handled in 202 distinct industries in Maryland, 162 in Kentucky, 143 in Virginia, 141 in Tennessee, 129 in Georgia, 119 in Texas, 114 in West Virginia, 110 in Louisiana, 90 in Alabama, 86 in North Carolina, 71 in South Carolina, 61 in Florida, 60 in Mississippi and 53 in Arkansas.

The dimensions already attained by these industries are indicated in the following figures of the value of factory products, specified in the latest census, of 50 different industries in the South, the figures not including the products of establishments which, for the insurance of privacy, were not itemized in the census:

Industries.	Value of products.
Salt	$466,782
Soap	1,532,159
Cordage and twine	2,132,273
Paints	2,136,495
Straw hats	2,241,627
Brooms and brushes	2,340,996
Pickles, preserves, etc	2,490,130
Structural iron	3,336,652
Woodturning	4,119,207
Women's clothing	4,717,416
Agricultural implements	4,790,695
Pottery	5,049,970
Glass	5,188,152
Bagging	5,603,831
Shipbuilding—wooden	5,756,837
Marble and stone	5,877,700
Tinware	6,628,375
Woolen goods	7,051,329
Paper and wood pulp	7,628,809
Boots and shoes	7,675,193
Wooden boxes	8,976,393
Patent medicines	9,767,375
Ice	9,844,430
Cooperage	10,156,644
Hosiery and knit goods	11,035,537
Saddlery, etc	11,523,858
Coke	13,143,877
Brick and tile	13,382,953
Rice cleaning	16,085,584
Carriages and wagons	16,788,158
Canning	18,293,366
Furniture	20,430,814
Bakery products	22,464,615
Turpentine and rosin	25,937,024
Leather	27,299,568
Slaughtering, etc	32,643,073
Fertilizers	37,198,385
Men's clothing	38,179,878
Liquors	39,357,441
Printing and publishing	43,041,780
Planing mills, etc	45,192,446
Foundries, etc	50,933,814
Iron and steel	61,647,271
Railroad car shops, etc	65,353,139
Sugar refining, etc	75,999,662
Cottonseed mills	81,939,847
Tobacco	90,142,001
Flour mills, etc	114,325,982
Cotton goods	168,609,801
Lumber and timber	234,214,912

Suggestive further of the diversification are such values as Alabama, brass castings and finishings $291,611; Arkansas, buttons $41,949; Florida, cigar boxes $260,544 and artificial stone $98,918; Georgia, cement $344,201, showcases $285,000 and trunks and valises $255,007; Kentucky, dressed flax and hemp $228,467 and vinegar and cider $912,541; Tennessee, lime $325,976 and mattresses and beds $436,386; Louisiana, awnings, tents and sails $128,049; Mississippi, illuminating gas $124,591; Texas, petroleum refining $5,708,396 and wood preserving $1,502,978; Maryland, iron and steel ships $3,516,314, umbrellas and canes $1,271,389 and druggists' preparations $3,265,220; North Carolina, wood distillation $74,531, silk and silk goods $229,927 and kaolin and ground earths $75,263; South Carolina, hand stamps $5900; Virginia, roofing materials $211,409 and woodenware $923,012, and West Virginia, bone, ivory and lampblack $274,022 and gypsum plaster $144,093.

The rank of the five leading States, according to the value of products in the several industries, is as follows:

Soap.—Kentucky, $483,670; Tennessee, $457,013; Maryland, $253,500; Texas, $163,366; Louisiana, $109,889.

Paints.—Maryland, $680,990; Kentucky, $522,017; Tennessee, $480,991; Georgia, $257,903; Virginia, $194,594.

Brooms, Brushes, etc.—Maryland, $996,709; Kentucky, $366,494; Texas, $258,024; Georgia, $193,282; Tennessee, $180,693.

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Patent Medicines.—Tennessee, $2,680,610; Kentucky, $1,723,025; Maryland, $1,436,533; Georgia, $1,370,445; Texas, $649,155.

Artificial Ice.—Texas, $2,083,880; Louisiana, $1,099,726; Maryland, $729,553; Kentucky, $703,365; Tennessee, $684,420.

Cooperage.—Kentucky, $2,972,517; Louisiana, $1,807,948; Virginia, $792,591; Maryland, $765,021; Texas, $740,958.

Hosiery and Knit Goods.—North Carolina, $2,483,827; Georgia, $2,325,854; Virginia, $2,107,602; Tennessee, $1,627,823; South Carolina, $1,078,682.

Saddlery and Harness.—Texas, $3,251,525; Georgia, $1,816,800; Kentucky, $1,750,654; Tennessee, $1,410,454; Louisiana, $872,545.

Coke.—Alabama, $6,175,126; West Virginia, $4,174,186; Virginia, $1,884,570; Tennessee, $809,801; Kentucky, $100,194.

Brick and Tile.—Virginia, $1,803,680; Georgia, $1,337,372; Texas, $1,304,663; Tennessee, $1,100,398; Maryland, $1,097,072.

Carriages and Wagons.—Kentucky, $4,059,438; North Carolina, $2,304,065; Georgia, $2,303,196; Virginia, $1,913,530; Tennessee, $1,774,725.

Canning.—Maryland, $12,686,711; Mississippi, $1,505,856; Virginia, $1,102,902; Louisiana, $919,584; South Carolina, $574,479.

Furniture.—North Carolina, $6,181,619; Maryland, $3,445,168; Tennessee, $3,238,248; Georgia, $2,115,379; Kentucky, $1,496,147.

Bakery Products.—Maryland, $5,158,645; Texas, $3,049,325; Louisiana, $2,685,626; Kentucky, $2,225,314; Tennessee, $1,974,323.

Turpentine and Rosin.—Florida, $9,901,905; Georgia, $7,705,643; Alabama, $2,434,363; Mississippi, $2,365,720; North Carolina, $743,421.

Leather.—West Virginia, $6,061,509; Virginia, $5,829,812; Kentucky, $3,952,277; Tennessee, $3,583,871; Georgia, $2,382,127.

Slaughtering and Packing.—Texas, $15,620,931; Maryland, $6,712,061; Kentucky, $5,793,731; Virginia, $1,996,338; West Virginia, $1,928,017.

Fertilizers.—Georgia, $9,461,415; Maryland, $6,631,763; Virginia, $4,659,281; South Carolina, $3,637,576; North Carolina, $3,098,561.

Men's Clothing.—Maryland, $19,654,916; Kentucky, $6,279,078; Tennessee, $2,961,581; Louisiana, $1,979,304; Georgia, $1,481,949.

Liquors.—Kentucky, $14,878,327; Maryland, $7,533,849; Texas, $4,153,938; Tennessee, $2,400,256; Louisiana, $2,286,714.

Printing and Publishing.—Texas, $7,816,347; Maryland, $5,493,112; Tennessee, $5,063,580; Kentucky, $4,768,351; Georgia, $3,837,546.

Planing Mills, etc.—Georgia, $6,618,544; Kentucky, $4,593,251; Tennessee, $4,586,918; Virginia, $4,224,052; Arkansas, $3,786,772.

Foundry and Machine Shops.—Alabama, $8,839,677; Maryland, $8,525,583; Tennessee, $5,830,678; Georgia, $5,125,943; Texas, $4,952,827.

Iron and Steel.—Alabama, $24,687,359; West Virginia, $13,454,802; Maryland, $8,106,929; Kentucky, $6,167,542; Virginia, $4,859,386.

Railroad Car Shops, etc.—Texas, $10,472,742; Virginia, $8,693,048; Alabama, $6,681,074; Tennessee, $5,839,445; Maryland, $5,751,908.

Cottonseed Mills.—Texas, $18,698,815; Georgia, $13,539,899; Louisiana, $13,187,608; Mississippi, $12,587,147; Alabama, $5,769,061.

Tobacco, Cigars, etc.—North Carolina, $28,087,969; Virginia, $16,768,208; Florida, $16,764,276; Kentucky, $14,913,049; Maryland, $4,648,003.

Flour and Grist Mills.—Tennessee, $25,350,758; Texas, $22,083,136; Kentucky, $18,007,786; Virginia, $13,832,299; Georgia, $8,178,926.

Cotton Goods.—South Carolina, $49,434,644; North Carolina, $47,254,054; Georgia, $35,174,248; Alabama, $16,760,332; Maryland, $5,244,742.

Lumber and Timber.—Louisiana, $35,192,374; Arkansas, $28,065,171; Mississippi, $24,035,539; Tennessee, $21,580,120; Texas, $16,278,240.

The rank in the value of other products is: Salt, Texas $351,050 and West Virginia $115,732, no figures for Louisiana's output being available; glass, West Virginia $4,598,563 and Maryland $589,589; sugar and molasses refining, Louisiana $73,786,659, Texas $1,979,214 and Kentucky $233,789; straw hats, Maryland $2,035,519 and Georgia $206,108; cordage and twine, North Carolina $1,035,648, Kentucky $597,694 and Alabama $498,931; bagging, Louisiana $4,076,226, North Carolina $1,310,742 and West Virginia $216,863; tinware, Maryland $6,290,940, Kentucky $287,691 and Tennessee $49,744; paper and wood pulp, Maryland $3,296,348, Virginia $3,034,395 and West Virginia $1,298,066; rice cleaning, Louisiana $10,718,311, Texas $4,640,269, South Carolina $554,575 and Georgia $172,429; the figures for North Carolina not being available. The value of the great iron and steel shipbuilding industry in Virginia is also not given.

The premiership by States in the 50 industries mentioned is as follows:

Alabama—Iron and steel, and coke, foundry and machine shops.

Florida—Turpentine and rosin.

Georgia—Fertilizers and planing mills, etc.

Kentucky—Soap, pickles and preserves, structural ironwork, liquors, woodturning, agricultural implements, carriages and wagons and cooperage.

Louisiana—Lumber, bagging, rice cleaning and sugar and molasses refining.

Maryland—Paints, brooms and brushes, women's clothing, tinware, paper and wood pulp, wooden ships and boats, straw hats, marble and stone, wooden boxes, canning, bakery products and men's clothing.

North Carolina—Tobacco, hosiery, furniture, cordage and twine.

South Carolina—Cotton goods.

Tennessee—Flour and grist mills, patent medicines and woolen goods.

Texas—Artificial ice, cottonseed mills, slaughtering and packing, printing and publishing, railroad car shops, etc., salt, and saddlery and harness.

Virginia—Boots and shoes and brick and tile.

West Virginia—Pottery, etc., leather and glass.

It must be borne in mind that these 50 selected industries are less than one-fifth of the total number of industries in the South, and that the total of their products is by no means the whole sum of the total of all Southern factory products. They have been discussed merely to indicate in how many directions the South is accomplishing as a manufacturer. The accompanying tables comparing by States the capital and the value of products of the leading industries in those States under the census of 1900 and that of 1905, which is really for the year ended December 31, 1904, in like manner are indicative of the speed of Southern factory progress and suggestive of its future status.

Dealing only with the value of products and with the industries in the several States showing an increase in that value between 1900 and 1904 of 50 per cent. or more, the following increases by industries are shown:

Bakery Products—From $1,302,615 to $3,049,325, or $1,746,710, equal to 134 per cent., in Texas.

Carriages and Wagons—From $1,055,292 to $2,304,065, or $1,248,773, equal to 118 per cent., in North Carolina.

Cigars and Cigarettes—From $229,844 to $2,599,248, or $2,369,404, equal to 1030 per cent., in North Carolina; from $2,840,319 to $4,648,003, or $1,807,684, equal to 62 per cent., in Maryland, and from $10,735,826 to $16,764,276, or $6,028,450, equal to 58 per cent., in Florida.

Coke—From $3,726,433 to $6,175,126, or $2,448,693, equal to 65 per cent., in Alabama.

Cotton Goods—From $8,153,136 to $16,760,332, or $8,607,196, equal to 105 per cent., in Alabama; from $18,457,645 to $35,174,248, or $16,716,603, equal to 90 per cent., in Georgia; from $1,994,935 to $3,560,984, or $1,566,049, equal to 78 per cent., in Tennessee; from $2,655,002

driveways and well-paved streets and parks are the pride of every loyal Missourian and excite the praise and wonder of every visitor. It is tritely said, here, indeed, are the veritable "Jack-built houses." Ohio, Pennsylvania, New York and New England have contributed liberally to the population, and few are the citizens, high or low, the foundation of whose contentment today cannot be traced to holding "Jack" at a time when the fortune-seeking game was far more trying, hazardous and uncertain.

The existence of lead in Missouri was known to the early French and Spanish settlers of the Mississippi valley, but mining was confined to the southeastern portion of the State. In 1848, according to one report, lead mining in Southwest Missouri was first begun by William Tingle, who found lead two miles east of Joplin, and the decade 1850 to 1860 marked the birth of the mining industry in Southwest Missouri. In about 1851 mining was begun on Center creek, near what is now known as Oronogo, but the Civil War crippled mining operations to such an extent that it was not until 1870, when John Sargent and E. R. Moffett discovered lead ores in large quantities within what are now the city limits of Joplin, that mining began in real earnest.

For a long time mining was confined entirely to lead only, which was often found by itself in paying quantities, but more frequently found closely affiliated with the zinc ore.

At first it was not known by those engaged in mining in this district that this zinc, commonly called "Jack," had any value, but when its usefulness first became recognized it was culled from the dump piles in large quantities and sold for from $6 to $7 per ton. From this time on zinc became an important factor in mining, and with a gradual increase in the price of zinc ore, due to a corresponding increase in the usages of metallic zinc, it became profitable to mine for zinc alone.

Since 1901 there has been a further rapid and continuous upward tendency in the value of these important metals, due entirely to demand created by the widening and increasing uses thereof and the failure of the production of the high-grade ores (practically confined to the Southwestern Missouri mineral field) to keep up with the immediate requirements of consumption. This is particularly true of lead, which has fallen greatly behind domestic consumption, and which condition, in turn, has forced importation. Indeed, it is authoritatively claimed that no new and important lead deposit has been brought to light in the United States during the past 12 years.

Lead enters into the manufacture of paints, oilcloth, rubber goods, telephone cables, printing type, pewter, solder, plumbers' supplies of various descriptions and all articles where non-corrosive metal is an essential; also numerous chemical and medicinal products, to say nothing of cannon, gun, rifle and revolver ammunition, and electrical appliances, conductors, batteries, etc.

The average individual will quickly describe the commercial uses and values of gold, silver, copper, iron, coal, etc., but ask him what zinc is used for and he will probably stop at washboards, bathtubs and the commonly-called "zinc," a sheet used under the kitchen or hall stove as a floor protection against fire or heat. Space forbids the full list, but sufficient is said when it is explained that zinc today is extensively used in preventing wear and tear on boilers, in the manufacture of nails, metal shingles, roofing, ornamental ceilings, moldings and castings, water and oil tanks, bath and wash tubs, washboards, linings for refrigerators, netting, screens, toys, wire, printing plates, engravings, bronze, galvanized-iron and brass products. Fifty-eight per cent. of the zinc produced enters into the manufacture of galvanized iron, 25 per cent. into brass products. Two million five hundred thousand pounds of zinc spelter has been consumed this year alone in the production of the common domestic "pin" and 17 per cent. into fine arts. Zinc paint for interior finishing is fast encroaching upon white lead. Zinc is indispensable to the cyanide process of gold extraction and also for the desilverization of lead.

The world's supply of tin is being rapidly exhausted, and zinc is the only metal offering a substitute therefor. These facts, together with the ever and phenomenally increasing requirements of electrical expansion, compels the conviction that the price of zinc must continue to rise not only in sympathy with copper and lead, with which it is so closely affiliated, but immeasurably so upon its own merit and importance in other commercial directions.

With respect to electrical expansion, experts predict that that field alone during the next 25 years will create a market for every surplus pound of zinc produced in the United States. The requirements of electricity are greater today than the entire production of the district only a few years ago. The natural result is that zinc concentrates have, as heretofore stated, increased steadily in value since the days when it was not appreciated and sold at $6 to $7 a ton until today when it has a firmly-established value of $50 per ton, ranging as high as $60. The lead, which is found in paying quantities in connection with zinc mining, is now selling at from $80 to $90 per ton, but on account of the uniform deposits of the zinc greater attention is paid to zinc mining, and lead is considered a by-product.

The growing importance of zinc has brought about rapid changes in the mining operations of the mineral belt, and although it is still known and invariably described as the Joplin district, in reality for several years past the big ore turn-ins have come from the newer camps. The mines which gave the pioneer Joplin district its name were usually of shallow pocket formations of lead, with zinc predominating. As a result, mining was very largely speculative. This pocket or chimney formation was to such a degree so uncertain that even after a strike was made the area or extent of the deposit was not apparent; hence in many instances a mine making $1000 a day for a week might, and, in fact, did, frequently become exhausted within a month.

Large bodies of pocket ore were discovered here and there and vast fortunes were made from a single mine. When a prospector would strike it rich a fortune awaited him. In one instance $1,600,000 worth of ore was taken from a single acre. Many prospectors, however, failed to make a strike for the reason there were no regular surface indications to mark the extent or the whereabouts of a deposit. Prospect drills were not in vogue and all prospecting was done by shaft sinking, which was very expensive.

Occasionally companies were organized or promoted and capitalized at a figure which might be fully justified in case the ore deposit was of sufficient extent to insure the continuous operation of the mine or mines for a term of years. Many of these companies were successful, but many, on the contrary, where the ore was worked out while the company was yet young, were failures, and in this way the reputation of the old Joplin district suffered to some extent, as has been the case in nearly every other mining camp of importance in the country.

In recent years the increased price of ore warranting improved machinery, and the discovery of a uniform sheet deposit of ore covering several square miles of territory in the Webb City-Porto Rico-Duenweg district, has justified mining operations on a much more extensive scale. Hand jigs of the early days are still to be seen around Joplin, and 75 to 100-ton mills are a common sight, but today in the newer camps above referred to 250-ton mills are becoming common, and there are several ranging in capacity from 500 to 1000 tons of rough dirt per day.

Large investors have come into the field. The value of land in the sheet-ground district runs in many instances to thousands of dollars per acre. Operators are now justified in investing $50,000 or even $100,000 in a single mill, as it is possible under modern conditions to test the extent and richness of the deposit by means of drills in advance of the sinking of shafts and the erection of mills. The operator of today knows what it costs to mine dirt and put it into the hopper as accurately as the flour miller knows what it will cost to put wheat into the elevator. The cost of milling is also figured to a fraction of a cent; hence the value of the finished product can be calculated as certainly as the selling price of a barrel of flour.

While even yet sufficient prospecting has not been done to determine the extent of this sheet-ground deposit, it is a pretty well-accepted fact that the ore body, which was first discovered within a mile and a half to the northwest of Webb City, where the Yellow Dog mine, the Newell-Morse and the Guinn land are located, runs in a southeasterly direction, apparently culminating in what is known as the Porto Rico-Duenweg district, about four miles distant.

The richest part of this sheet-ore deposit appears to be both the northwest and southeast extremities, and here it has been proven up in width to the extent of about two miles. In some places in the course of the apparent run it seems to narrow down considerably. When more prospecting is done the exact extent and boundaries will undoubtedly be located, but as yet the sheet-ground prospecting might almost be said to be in its infancy.

In the Porto Rico district a single 80-acre tract is held at $800,000, and this tract is paying to the owner in royalty over $100,000 per year.

Adjoining the same is the Trinity tract, and as an illustration of the uniform richness of this 120 acres, in 38 drill holes sunk an average face of 20 feet of ore was shown in every hole.

As an evidence of marked development in this district, 18 months ago only five mills of a small type were in operation. Within the past year over 100 drill holes have been sunk into ore within a radius of one mile. Over 20 shafts have been sunk to ore and 20 more are being put down at this time. Ten new mills have been erected and are in operation, and 15 more, all with a daily capacity of from 300 to 500 tons, are under construction, six of which are being erected by the Cathedral Mining & Smelting Co., fostered by Eastern and New England capital.

In the Webb City section of this sheet deposit there are now over 25 mills in operation. Several new ones are now being built, and active development in this neighborhood dates back to only three or four years ago.

Webb City is not only the center of this large sheet-ore district, but is now the geographical center of the entire Southwest Missouri field, and the mines within three miles of this thriving city produce 100 per cent. more ore than all the mines in the old Joplin district combined.

The reason that this Webb City district has taken pre-eminence over Joplin is not only on account of this uniform sheet deposit, which has eliminated speculation from mining in this field and placed it on the same basis as a New England manufacturing concern, thus justifying the capitalist in investing extensively, but because of the greater affiliation of the lead with the zinc.

To be mining for zinc at $50 a ton and be taking out daily as a by-product several tons of lead at a value of from $80 to $90 per ton is very attractive to capital, to say the least.

This sheet ground is so uniform that by the sinking of drill holes the approximate value of the deposit under a given area can be determined. There speculation ends, and the amount of profits from that time on depends upon the management. The more economical, thrifty and businesslike the administration the greater the profits.

So great has been the development of this sheet-ground district during the past year that already the basis selling price of ore is fixed on not what it costs to produce the ore in some of the shallow or soft ground mines of the Joplin district, but what it costs to produce ore in the Webb City sheet-ground district. It is confidently asserted that prices can never go so low that mining in this district will be unprofitable, because if they did so the output of the district would be curtailed 75 per cent., which would not leave enough ore to keep one-fourth of the smelters in operation.

The ore is purchased in the bins at the mill by the buyers representing the smelters. These buyers visit all mills weekly and make their bids. They load all ore on the cars at their own expense.

The demand for ore is increasing daily, and although there is a reasonable profit in sheet-ground mining at $40 or even $35 per ton, it is predicted that zinc ore will inside of the next two years sell as readily at $60 per ton as it does now for $50.

As stated in the beginning of this article, while this great but comparatively obscure mineral region has for years annually contributed millions of dollars to the productive wealth of the whole country, it can truthfully be said to be just entering its bonanza age, in which large capital will find security and abundant profit. To be conservative, however, in the opinion of the best judges, it should be invested in sheet-ground mining, where land already prospected and proven can be leased on a royalty basis or purchased outright. By following such a course the element of chance is eliminated as much so as it is from any legitimate field of manufacture.

BIG PLANT FOR NORFOLK.

Branch of United States Wood Preserving Co. of New York.

An important addition to the manufacturing interests of Norfolk, Va., and vicinity is announced as to be established at Money Point. This plant will be built by the United States Wood Preserving Co. of 29 Broadway, New York city, which now has a large plant in New Jersey. The company manufactures wood blocks for paving, large quantities of which are now being used throughout the country, and the demand for which is increasing. It will use large quantities of the gum timber grown in the Great Dismal Swamp, and is reported as at present consuming from 2,000,000 to 3,000,000 feet of timber every month. The gum will be sawn into blocks, which are filled with creosote oil and then shipped to the cities where paving is to be undertaken. It is reported that the Norfolk plant will represent the investment of approximately $500,000. A 10-acre site on the Elizabeth river is to be occupied by the plant.

Growth of Southern Factory Diversification

By Edward Ingle.

[Written for the Manufacturers' Record.]

Of the 339 separate kinds of industries within the scope of the 1905 census of manufactures, 262 are represented in the 14 Southern States. That exhibit will probably surprise many persons who have been accustomed to view manufacturing in the South, in comparison with the rest of the country, as something just beginning to evolve and as concerned chiefly with the primary handling of the raw material upon which a vast range of manipulations is based. But the figures show that the South is using, in ever-increasing quantities and to greater and greater wealth-producing effect, many forms of secondary and tertiary products of cotton, iron, lumber, leather, phosphate rock, clays and other minerals. They show such materials handled in 202 distinct industries in Maryland, 162 in Kentucky, 143 in Virginia, 141 in Tennessee, 129 in Georgia, 119 in Texas, 114 in West Virginia, 110 in Louisiana, 90 in Alabama, 86 in North Carolina, 71 in South Carolina, 61 in Florida, 60 in Mississippi and 53 in Arkansas.

The dimensions already attained by these industries are indicated in the following figures of the value of factory products, specified in the latest census, of 50 different industries in the South, the figures not including the products of establishments which, for the insurance of privacy, were not itemized in the census:

Industries.	Value of products.
Salt	$466,782
Soap	1,532,159
Cordage and twine	2,132,273
Paints	2,136,495
Straw hats	2,241,627
Brooms and brushes	2,340,996
Pickles, preserves, etc.	2,490,130
Structural iron	3,336,652
Woodturning	4,119,207
Women's clothing	4,717,416
Agricultural implements	4,790,695
Pottery	5,049,970
Glass	5,188,152
Bagging	5,603,831
Shipbuilding—wooden	5,756,837
Marble and stone	5,877,700
Tinware	6,628,375
Woolen goods	7,051,329
Paper and wood pulp	7,628,809
Boots and shoes	7,675,193
Wooden boxes	8,976,393
Patent medicines	9,767,375
Ice	9,844,430
Cooperage	10,156,644
Hosiery and knit goods	11,035,537
Saddlery, etc.	11,523,858
Coke	13,143,877
Brick and tile	13,382,953
Rice cleaning	16,085,584
Carriages and wagons	16,788,158
Canning	18,293,366
Furniture	20,430,814
Bakery products	22,464,615
Turpentine and rosin	23,937,024
Leather	27,299,568
Slaughtering, etc.	32,643,073
Fertilizers	37,198,385
Men's clothing	38,179,878
Liquors	39,357,441
Printing and publishing	43,041,780
Planing mills, etc.	45,192,446
Foundries, etc.	50,933,814
Iron and steel	61,647,271
Railroad car shops, etc.	65,353,139
Sugar refining, etc.	75,999,662
Cottonseed mills	81,939,847
Tobacco	90,142,001
Flour mills, etc.	114,325,982
Cotton goods	168,609,801
Lumber and timber	234,214,912

Suggestive further of the diversification are such values as Alabama, brass castings and finishings $291,611; Arkansas, buttons $41,949; Florida, cigar boxes $260,544 and artificial stone $98,918; Georgia, cement $344,201, showcases $285,000 and trunks and valises $255,007; Kentucky, dressed flax and hemp $228,467 and vinegar and cider $912,541; Tennessee, lime $325,976 and mattresses and beds $436,386; Louisiana, awnings, tents and sails $128,049; Mississippi, illuminating gas $124,591; Texas, petroleum refining $5,708,396 and wood preserving $1,502,978; Maryland, iron and steel ships $3,516,314, umbrellas and canes $1,271,389 and druggists' preparations $3,265,220; North Carolina, wood distillation $74,531, silk and silk goods $229,927 and kaolin and ground earths $75,263; South Carolina, hand stamps $5900; Virginia, roofing materials $211,409 and woodenware $923,012, and West Virginia, bone, ivory and lampblack $274,022 and gypsum plaster $144,093.

The rank of the five leading States, according to the value of products in the several industries, is as follows:

Soap.—Kentucky, $483,670; Tennessee, $457,013; Maryland, $253,500; Texas, $163,366; Louisiana, $109,889.

Paints.—Maryland, $680,990; Kentucky, $522,017; Tennessee, $480,991; Georgia, $257,903; Virginia, $194,594.

Brooms, Brushes, etc.—Maryland, $996,709; Kentucky, $366,494; Texas, $258,024; Georgia, $193,282; Tennessee, $180,693.

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Wooden Boxes.—Maryland, $2,769,336; Virginia, $1,461,851; Kentucky, $1,433,044; Tennessee, $697,427; Georgia, $593,622.

Patent Medicines.—Tennessee, $2,680,610; Kentucky, $1,723,025; Maryland, $1,436,533; Georgia, $1,370,445; Texas, $649,155.

Artificial Ice.—Texas, $2,083,880; Louisiana, $1,099,726; Maryland, $729,553; Kentucky, $703,365; Tennessee, $684,420.

Cooperage.—Kentucky, $2,972,517; Louisiana, $1,807,948; Virginia, $792,591; Maryland, $765,021; Texas, $740,958.

Hosiery and Knit Goods.—North Carolina, $2,483,827; Georgia, $2,325,854; Virginia, $2,107,602; Tennessee, $1,627,823; South Carolina, $1,078,682.

Saddlery and Harness.—Texas, $3,251,525; Georgia, $1,816,800; Kentucky, $1,750,654; Tennessee, $1,410,454; Louisiana, $872,545.

Coke.—Alabama, $6,175,126; West Virginia, $4,174,186; Virginia, $1,884,570; Tennessee, $809,801; Kentucky, $100,194.

Brick and Tile.—Virginia, $1,803,680; Georgia, $1,337,372; Texas, $1,304,663; Tennessee, $1,100,398; Maryland, $1,097,072.

Carriages and Wagons.—Kentucky, $4,059,438; North Carolina, $2,304,065; Georgia, $2,303,196; Virginia, $1,913,530; Tennessee, $1,774,725.

Canning.—Maryland, $12,686,711; Mississippi, $1,505,856; Virginia, $1,102,902; Louisiana, $919,584; South Carolina, $574,479.

Furniture.—North Carolina, $6,181,619; Maryland, $3,445,168; Tennessee, $3,238,248; Georgia, $2,115,379; Kentucky, $1,496,147.

Bakery Products.—Maryland, $5,158,645; Texas, $3,049,325; Louisiana, $2,685,626; Kentucky, $2,225,314; Tennessee, $1,974,323.

Turpentine and Rosin.—Florida, $9,901,905; Georgia, $7,705,643; Alabama, $2,434,363; Mississippi, $2,365,720; North Carolina, $743,421.

Leather.—West Virginia, $6,061,509; Virginia, $5,829,812; Kentucky, $3,952,277; Tennessee, $3,583,871; Georgia, $2,382,127.

Slaughtering and Packing.—Texas, $15,620,931; Maryland, $6,712,061; Kentucky, $5,793,731; Virginia, $1,996,338; West Virginia, $1,928,017.

Fertilizers.—Georgia, $9,461,415; Maryland, $6,631,763; Virginia, $4,659,281; South Carolina, $3,637,576; North Carolina, $3,098,561.

Men's Clothing.—Maryland, $19,654,916; Kentucky, $6,279,078; Tennessee, $2,961,581; Louisiana, $1,979,304; Georgia, $1,481,949.

Liquors.—Kentucky, $14,878,327; Maryland, $7,533,849; Texas, $4,153,938; Tennessee, $2,400,256; Louisiana, $2,286,714.

Printing and Publishing.—Texas, $7,816,347; Maryland, $5,493,112; Tennessee, $5,063,580; Kentucky, $4,768,351; Georgia, $3,837,546.

Planing Mills, etc.—Georgia, $6,618,544; Kentucky, $4,593,251; Tennessee, $4,586,918; Virginia, $4,224,052; Arkansas, $3,786,772.

Foundry and Machine Shops.—Alabama, $8,839,677; Maryland, $8,525,583; Tennessee, $5,830,678; Georgia, $5,125,943; Texas, $4,952,827.

Iron and Steel.—Alabama, $24,687,359; West Virginia, $13,454,802; Maryland, $8,106,929; Kentucky, $6,167,542; Virginia, $4,859,386.

Railroad Car Shops, etc.—Texas, $10,472,742; Virginia, $8,693,048; Alabama, $6,681,074; Tennessee, $5,839,445; Maryland, $5,751,908.

Cottonseed Mills.—Texas, $18,698,815; Georgia, $13,539,899; Louisiana, $13,187,608; Mississippi, $12,587,147; Alabama, $5,769,061.

Tobacco, Cigars, etc.—North Carolina, $28,087,969; Virginia, $16,768,208; Florida, $16,764,276; Kentucky, $14,913,049; Maryland, $4,648,003.

Flour and Grist Mills.—Tennessee, $25,350,758; Texas, $22,083,136; Kentucky, $18,007,786; Virginia, $13,832,299; Georgia, $8,178,926.

Cotton Goods.—South Carolina, $49,434,644; North Carolina, $47,254,054; Georgia, $35,174,248; Alabama, $16,760,332; Maryland, $5,244,742.

Lumber and Timber.—Louisiana, $35,192,374; Arkansas, $28,065,171; Mississippi, $24,035,539; Tennessee, $21,580,120; Texas, $16,278,240.

The rank in the value of other products is: Salt, Texas $351,050 and West Virginia $115,732, no figures for Louisiana's output being available; glass, West Virginia $4,598,563 and Maryland $589,589; sugar and molasses refining, Louisiana $73,786,659, Texas $1,979,214 and Kentucky $233,789; straw hats, Maryland $2,035,519 and Georgia $206,108; cordage and twine, North Carolina $1,035,648, Kentucky $597,694 and Alabama $498,931; bagging, Louisiana $4,076,226, North Carolina $1,310,742 and West Virginia $216,863; tinware, Maryland $6,290,940, Kentucky $287,691 and Tennessee $49,744; paper and wood pulp, Maryland $3,296,348, Virginia $3,034,395 and West Virginia $1,298,066; rice cleaning, Louisiana $10,718,311, Texas $4,640,269, South Carolina $554,575 and Georgia $172,429; the figures for North Carolina not being available. The value of the great iron and steel shipbuilding industry in Virginia is also not given.

The premiership by States in the 50 industries mentioned is as follows:

Alabama—Iron and steel, and coke, foundry and machine shops.

Florida—Turpentine and rosin.

Georgia—Fertilizers and planing mills, etc.

Kentucky—Soap, pickles and preserves, structural ironwork, liquors, woodturning, agricultural implements, carriages and wagons and cooperage.

Louisiana—Lumber, bagging, rice cleaning and sugar and molasses refining.

Maryland—Paints, brooms and brushes, women's clothing, tinware, paper and wood pulp, wooden ships and boats, straw hats, marble and stone, wooden boxes, canning, bakery products and men's clothing.

North Carolina—Tobacco, hosiery, furniture, cordage and twine.

South Carolina—Cotton goods.

Tennessee—Flour and grist mills, patent medicines and woolen goods.

Texas—Artificial ice, cottonseed mills, slaughtering and packing, printing and publishing, railroad car shops, etc., salt, and saddlery and harness.

Virginia—Boots and shoes and brick and tile.

West Virginia—Pottery, etc., leather and glass.

It must be borne in mind that these 50 selected industries are less than one-fifth of the total number of industries in the South, and that the total of their products is by no means the whole sum of the total of all Southern factory products. They have been discussed merely to indicate in how many directions the South is accomplishing as a manufacturer. The accompanying tables comparing by States the capital and the value of products of the leading industries in those States under the census of 1900 and that of 1905, which is really for the year ended December 31, 1904, in like manner are indicative of the speed of Southern factory progress and suggestive of its future status.

Dealing only with the value of products and with the industries in the several States showing an increase in that value between 1900 and 1904 of 50 per cent. or more, the following increases by industries are shown:

Bakery Products—From $1,302,615 to $3,049,325, or $1,746,710, equal to 134 per cent., in Texas.

Carriages and Wagons—From $1,055,292 to $2,304,065, or $1,248,773, equal to 118 per cent., in North Carolina.

Cigars and Cigarettes—From $229,844 to $2,599,248, or $2,369,404, equal to 1030 per cent., in North Carolina; from $2,840,319 to $4,648,003, or $1,807,684, equal to 62 per cent., in Maryland, and from $10,735,826 to $16,764,276, or $6,028,450, equal to 58 per cent., in Florida.

Coke—From $3,726,433 to $6,175,126, or $2,448,693, equal to 65 per cent., in Alabama.

Cotton Goods—From $8,153,136 to $16,760,332, or $8,607,196, equal to 105 per cent., in Alabama; from $18,457,645 to $35,174,248, or $16,716,603, equal to 90 per cent., in Georgia; from $1,994,935 to $3,560,984, or $1,566,049, equal to 78 per cent., in Tennessee; from $2,655,002

to $4,484,131, or $1,829,129, equal to 68 per cent., in Virginia; from $1,472,835 to $2,462,808, or $989,973, equal to 67 per cent., in Mississippi; from $28,372,798 to $47,254,054, or $18,881,256, equal to 66 per cent., in North Carolina, and from $29,723,919 to $49,437,644, or $19,713,725, equal to 66 per cent., in South Carolina.

Alabama.

Industries.	Capital. 1900.	Capital. 1905.	Products. 1900.	Products. 1905.
Iron and steel	$15,913,479	$29,044,289	$17,392,483	$24,687,359
Cotton goods	11,638,757	24,758,049	8,153,136	16,760,332
Lumber and timber	7,855,629	12,625,688	12,522,423	15,939,814
Foundry and machine shops	4,826,825	6,375,866	5,482,441	9,122,874
Railroad car shops, etc	2,019,434	2,104,291	4,172,192	6,681,074
Coke	3,855,379	3,425,193	3,726,433	6,175,126
Cottonseed mills	1,609,674	5,168,939	2,985,890	5,769,061
Turpentine and rosin	1,176,391	767,048	2,033,705	2,434,365
Fertilizers	1,407,323	3,050,922	2,068,162	2,341,132
Planing mills, etc	345,872	1,316,632	763,125	2,095,968
Printing and publishing	346,826	1,469,113	1,159,803	1,946,724
Total	$51,495,589	$90,106,030	$60,459,793	$93,953,829

Cottonseed Mills—From $2,985,890 to $5,769,061, or $2,783,171, equal to 93 per cent., in Alabama; from $6,681,121 to $12,587,147, or $5,906,026, equal to 88 per cent., in Mississippi; from $7,026,452 to $13,187,608, or $6,161,156, equal to 87 per cent., in Louisiana; from $3,103,425 to $5,462,818, or $2,359,393, equal to 76 per cent., in South Carolina; from $8,064,-112 to $13,539,899, or $5,475,787, equal to 67 per cent., in Georgia, and from $3,188,812 to $4,939,919, or $1,751,107, equal to 54 per cent., in Arkansas.

Fertilizers—From $500,239 to $1,590,-371, or $1,090,132, equal to 217 per cent., in Florida; from $3,367,353 to $9,461,-415, or $6,094,062, equal to 180 per cent., in Georgia; from $492,772 to $1,082,387, or $589,615, equal to 119 per cent. in Mississippi; from $1,497,625 to $3,098,561, or $1,600,936, equal to 106 per cent., in North Carolina, and from $1,466,288 to $2,700,561, or $1,234,273, equal to 84 per cent., in Tennessee.

Flour and Grist Mills—From $3,792,-629 to $6,200,291, or $2,407,662, equal to 63 per cent., in West Virginia; from $8,942,198 to $13,832,299, or $4,890,101, equal to 54 per cent., in Virginia, and from $2,682,426 to $4,952,827, or $2,270,401, equal to 84 per cent., in Texas; from $1,394,770 to $2,464,551, or $1,069,781, equal to 76 per cent., in North Carolina; from $5,482,441 to $9,122,874, or $3,640,-433, equal to 66 per cent., in Alabama; from $3,506,427 to $5,587,811, or $2,081,-384, equal to 59 per cent., in Georgia, and from $4,479,489 to $6,946,567, or $2,467,078, equal to 55 per cent., in Tennessee.

Furniture—From $1,547,305 to $6,181,-619, or $4,634,314, equal to 299 per cent., in North Carolina, and from $1,106,623 to $3,238,248, or $2,131,625, equal to 192 per cent., in Tennessee.

Glass—From $1,871,795 to $4,598,563, or $2,726,768, equal to 145 per cent., in West Virginia.

Hosiery and Knit Goods—From $395,-150 to $1,627,823, or $1,232,673, equal to 311 per cent., in Tennessee; from $392,-237 to $1,078,682, or $686,445, equal to 175 per cent., in South Carolina, and from $1,023,150 to $2,483,827, or $1,460,677, equal to 142 per cent., in North Carolina.

Ice (artificial)—From $1,184,332 to $2,083,880, or $899,548, equal to 75 per cent., in Texas.

Arkansas.

Industries.	Capital. 1900.	Capital. 1905.	Products. 1900.	Products. 1905.
Lumber and timber	$15,047,973	$27,034,651	$24,357,503	$28,065,171
Cottonseed mills	2,484,794	4,105,585	3,188,812	4,939,919
Planing mills, etc	1,213,011	2,455,439	2,266,522	3,786,772
Flour and grist mills	828,315	1,352,669	2,757,608	3,702,496
Railroad car shops, etc	720,907	561,317	2,095,447	3,07[illegible],537
Printing and publishing	777,748	1,314,691	1,013,807	1,443,133
Total	$21,072,748	$36,824,352	$35,679,759	$45,015,032

Florida.

Industries.	Capital. 1900.	Capital. 1905.	Products. 1900.	Products. 1905.
Cigars and cigarettes	$5,337,107	$7,383,963	$10,735,826	$16,764,276
Lumber and timber	8,542,156	11,556,330	10,775,479	10,901,650
Turpentine and rosin	5,526,618	2,939,275	6,469,605	9,901,905
Planing mills, etc	415,349	1,125,285	777,782	1,690,455
Fertilizers	733,369	899,049	500,239	1,590,371
Railroad car shops, etc	414,390	439,845	1,112,245	1,156,441
Printing and publishing	538,743	1,413,734	603,410	1,139,103
Total	$21,507,732	$25,757,481	$30,974,586	$43,144,201

Georgia.

Industries.	Capital. 1900.	Capital. 1905.	Products. 1900.	Products. 1905.
Cotton goods	$24,158,159	$42,349,618	$18,457,645	$35,174,248
Lumber and timber	7,605,257	10,717,658	13,341,100	14,435,563
Cottonseed mills	4,098,668	11,527,007	8,064,112	13,539,899
Fertilizers	6,663,618	11,158,070	3,367,353	9,461,415
Flour and grist mills	1,337,760	1,895,718	5,323,786	8,178,926
Turpentine and rosin	3,785,432	2,373,880	8,110,468	7,705,643
Planing mills, etc	2,074,226	4,085,826	4,302,976	6,618,544
Foundry and machine shops	3,398,141	5,511,764	3,506,427	5,587,811
Railroad car shops, etc	1,408,592	2,102,313	3,062,283	4,775,109
Total	$54,529,853	$91,721,854	$67,536,210	$105,477,158

Leather—From $3,210,753 to $6,061,-509, or $2,850,756, equal to 88 per cent., in West Virginia, and from $1,502,378 to $2,662,174, or $1,159,796, equal to 77 per cent., in North Carolina.

Liquors (distilled)—From $1,616,362 to $2,566,786, or $950,424, equal to 58 per cent., in Maryland.

Kentucky.

Industries.	Capital. 1900.	Capital. 1905.	Products. 1900.	Products. 1905.
Flour and grist mills	$4,388,555	$7,342,417	$13,017,043	$18,007,786
Lumber and timber	7,246,823	11,799,697	13,338,533	14,539,000
Tobacco, smoking, etc	3,485,793	21,268,822	14,948,192	13,117,000
Liquors, distilled	12,280,054	17,774,190	9,786,527	11,204,649
Clothing, men's	1,509,136	4,841,327	3,420,365	6,279,078
Iron and steel	3,134,287	4,716,080	5,004,572	6,167,542
Railroad car shops	1,761,958	2,412,691	4,248,029	5,739,071
Slaughtering, etc	1,326,976	1,464,299	5,177,167	5,693,731
Printing and publishing	3,421,357	4,762,981	3,241,203	4,768,351
Foundry and machine shops	3,445,369	4,251,400	4,434,610	4,699,559
Planing mills, etc	1,508,038	3,275,114	1,891,517	4,593,251
Carriages and wagons	3,075,823	4,225,145	2,849,713	4,059,438
Leather	4,681,389	4,428,693	3,757,016	3,952,277
Liquors, malt	5,131,654	6,900,477	3,186,627	3,673,678
Cigars and cigarettes	1,105,303	1,422,335	1,506,559	1,796,049
Total	$57,502,515	$100,355,668	$89,807,673	$108,290,460

from $5,323,786 to $8,178,926, or $2,855,-140, equal to 53 per cent., in Georgia.

Foundry and Machine Shops—From $1,401,852 to $2,673,770, or $1,271,918, equal to 90 per cent., in West Virginia; from $489,769 to $919,940, or $430,171, equal to 87 per cent., in Mississippi; from $1,080,610, or $1,176,988, equal to 78 per cent., in Tennessee.

Liquors (malt)—From $1,113,021 to $2,145,503, or $1,032,482, equal to 92 per cent., in West Virginia; from $1,472,062 to $2,286,714, or $814,652, equal to 55 per cent., in Louisiana, and from $2,689,-606 to $4,153,938, or $1,464,332, equal to 54 per cent., in Texas.

Lumber and Timber—From $17,294,-444 to $35,192,374, or $17,897,930, equal to 103 per cent., in Louisiana, and from $15,286,763 to $24,035,539, or $8,748,776, equal to 57 per cent., in Mississippi.

Men's Clothing—From $3,420,365 to $6,279,078, or $2,858,713, equal to 83 per cent., in Kentucky, and from $1,631,-075 to $2,961,581, or $1,330,506, equal to 81 per cent., in Tennessee.

Oyster Canning—From $569,000 to $1,502,497, or $933,497, equal to 164 per cent., in Mississippi.

Paper and Wood Pulp—From $850,-386 to $3,034,395, or $2,184,009, equal to 255 per cent., in Virginia.

Patent Medicines—From $1,503,622 to $2,680,610, or $1,176,988, equal to 78 per cent., in Tennessee.

Planing Mills, etc.—From $763,125 to $2,095,968, or $1,332,843, equal to 174 per cent., in Alabama; from $1,891,517 to $4,593,251, or $2,701,734, equal to 142 per cent., in Louisiana; from $1,315,-775 to $2,126,250, or $810,475, equal to 61 per cent., in Mississippi; from $2,686,-898 to $4,224,052, or $1,537,154, equal to 57 per cent., in Virginia, and from $4,302,-976 to $6,618,544, or $2,315,568, equal to 53 per cent., in Georgia.

Printing and Publishing—From $603,-410 to $1 139,103, or $535,693, equal to 88 per cent., in Florida; from $4,577,110 to $7,782,247, or $3,205,137, equal to 70 per cent., in Texas, and from $1,159,803 to $1,946,724, or $786,921, equal to 67 per cent., in Alabama.

Rice Cleaning—From $5,736,451 to $10,718,311, or $4,981,860, equal to 86 per cent., in Louisiana.

Railroad Car Shops, etc.—From $1,331,-401 to $2,886,422, or $1,555,021, equal to 116 per cent., in Mississippi; from $3,113,053 to $5,839,445, or $2,726,392, equal to 87 per cent., in Tennessee; from $1,429,099 to $2,635,290, or $1,206,191, equal to 84 per cent., in Louisiana; from $1,511,376 to $2,443,926, or $932,550, equal to 61 per cent., in North Carolina; from $4,172,192 to $6,681,074, or $2,507,-882, equal to 60 per cent., in Alabama, and from $691,361 to $1,080,900, or $389,-539, equal to 56 per cent., in South Carolina.

Shirts—From $3,978,458 to $5,998,249, or $2,019,791, equal to 50 per cent., in Maryland.

Slaughtering and Packing — From $3,904,491 to $15,620,931, or $11,716,440, equal to 300 per cent., in Texas.

Sugar and Molasses Refining—From $46,747,937 to $73,786,659, or $27,038,-

Louisiana.

Industries.	Capital. 1900.	Capital. 1905.	Products. 1900.	Products. 1905.
Sugar and molasses	$52,605,705	$54,372,060	$46,747,937	$73,786,659
Lumber and timber	13,793,193	37,385,028	17,294,444	35,192,374
Cottonseed mills	4,622,569	8,686,711	7,026,452	13,187,608
Rice cleaning, etc	1,818,144	6,138,228	5,736,451	10,718,311
Bagging	819,310	1,145,384	3,443,468	4,076,226
Foundry and machine shops	2,949,113	31,943,989	2,672,761	3,149,209
Printing and publishing	1,658,023	2,100,119	2,020,708	3,147,867
Bakery products	931,542	787,104	2,295,753	2,685,626
Planing mills, etc	1,040,035	1,949,001	1,573,481	2,683,613
Railroad car shops, etc	782,588	1,471,097	1,429,099	2,635,290
Liquors, malt	3,299,326	3,105,300	1,472,062	2,286,714
Total	$84,319,548	$121,584,021	$91,712,616	$153,549,497

Maryland.

Industries.	Capital. 1900.	Capital. 1905.	Products. 1900.	Products. 1905.
Clothing, men's	$8,458,116	$9,019,897	$17,327,825	$19,654,916
Canning and preserving	5,182,330	6,987,188	13,993,663	12,686,711
Iron and steel	2,892,690	7,128,091	8,739,405	12,230,409
Foundry and machine shops	6,381,676	7,523,033	8,443,547	9,172,034
Flour and grist mills	3,005,676	2,717,258	7,237,962	7,318,212
Tinware, etc	2,765,367	14,664,470	5,942,739	6,833,452
Fertilizers	7,003,376	6,068,246	5,481,905	6,631,763
Slaughtering, etc	1,080,597	1,262,102	5,059,374	6,332,914
Shirts	1,323,091	3,746,249	3,978,458	5,998,249
Railroad car shops, etc	2,877,954	2,303,354	4,573,229	5,751,908
Printing and publishing	3,837,988	4,281,901	4,871,289	5,493,112
Cotton goods	7,709,256	6,365,149	5,423,251	5,244,742
Bakery products	1,870,270	1,920,572	3,975,964	5,158,645
Liquors, malt	13,857,323	6,486,090	4,133,797	4,967,063
Cigars and cigarettes	1,518,861	5,017,841	2,840,319	4,648,003
Shipbuilding	4,424,323	4,225,620	4,115,644	4,541,165
Furniture	1,584,984	2,291,266	2,976,494	3,445,168
Planing mills, etc	3,259,501	2,332,519	3,553,063	3,417,113
Paper and wood pulp	2,720,877	6,350,458	2,589,540	3,296,348
Clothing, women's	841,345	1,214,610	2,685,576	3,195,498
Lumber and timber	1,402,264	1,735,837	2,223,150	2,750,339
Liquors, distilled	2,326,272	3,719,269	1,616,362	2,566,786
Total	$86,334,137	$107,940,720	$121,782,576	$141,334,550

Mississippi.

Industries.	Capital. 1900.	Capital. 1905.	Products. 1900.	Products. 1905.
Lumber and timber	$10,117,421	$23,439,225	$15,286,763	$24,035,539
Cottonseed mills	3,711,930	8,551,910	6,681,121	12,587,147
Railroad car shops, etc	741,753	1,337,132	1,331,401	2,886,422
Cotton goods	2,209,749	4,520,133	1,472,835	2,462,808
Turpentine and rosin	798,373	598,146	1,772,435	2,365,720
Planing mills, etc	631,553	1,379,616	1,315,775	2,126,250
Oyster canning	205,549	965,027	569,000	1,502,497
Fertilizers	353,497	1,048,733	492,772	1,082,387
Foundry and machine shops	390,008	875,116	489,769	919,940
Total	$19,159,833	$42,715,038	$29,411,871	$49,968,710

North Carolina.

Industries.	Capital. 1900.	Capital. 1905.	Products. 1900.	Products. 1905.
Cotton goods	$33,011,516	$57,413,418	$23,372,798	$47,254,054
Tobacco, smoking, etc	6,874,908	32,028,980	13,620,816	25,488,721
Lumber and timber	8,649,158	10,068,358	14,474,281	15,731,379
Flour and grist mills	1,519,266	1,990,346	4,702,514	6,863,770
Furniture	1,023,374	4,621,994	1,547,305	6,181,619
Cottonseed mills	1,841,856	3,118,343	2,676,871	3,748,789
Planing mills, etc	1,366,823	1,730,711	2,892,058	3,402,471
Fertilizers	2,818,921	3,697,799	1,497,625	3,098,561
Leather	1,299,798	2,568,965	1,502,378	2,662,174
Cigars and cigarettes	169,980	4,048,017	229,844	2,599,248
Hosiery, etc	674,869	2,080,649	1,023,150	2,483,827
Foundry and machine shops	1,017,758	2,123,440	1,394,770	2,464,551
Railroad car shops, etc	539,513	857,566	1,511,376	2,443,926
Carriages and wagons	860,683	2,010,457	1,055,292	2,304,065
Total	$61,668,423	$128,359,043	$76,501,078	$126,727,159

South Carolina.

Industries.	Capital. 1900.	Capital. 1905.	Products. 1900.	Products. 1905.
Cotton goods	$39,258,946	$82,337,429	$29,723,919	$49,437,644
Lumber and timber	3,469,984	7,237,725	4,942,362	6,791,451
Cottonseed mills	1,959,872	5,177,178	3,103,425	5,462,818
Fertilizers	10,505,043	7,086,878	4,882,506	3,637,576
Planing mills, etc	412,128	947,186	1,016,328	1,478,581
Railroad car shops, etc	354,842	299,923	691,361	1,080,900
Hosiery, etc	345,212	823,822	392,237	1,078,682
Total	$56,306,027	$103,910,141	$44,752,138	$68,967,742

722, equal to 55 per cent., in Louisiana.

Tobacco (smoking, chewing, etc.)—From $13,620,816 to $25,488,721, or $11,867,905, in North Carolina.

Turpentine and Rosin—From $6,469,605 to $9,901,905, or $3,432,300, equal to 53 per cent., in Florida.

Such marked increases as 217 per cent. for fertilizers in Florida, 299 per cent. for furniture in North Carolina, 145 per cent. for glass in West Virginia, 311 per cent. for hosiery and knit goods in Tennessee, 103 per cent. for lumber and timber in Louisiana, 164 per cent. for oyster canning in Mississippi, 255 per cent. for paper and wood pulp in Virginia, 86 per cent. for rice cleaning in Louisiana, 116 per cent. for railroad car shops, etc., in Mississipi and 300 per cent. for slaughtering and packing in Texas are manifestations of the trend of industries from one part of the South to another or from other parts of the country to the South. They show that oysters of the Gulf are to share the markets with the oysters of the Chesapeake basin, that natural-gas development in West Virginia is bringing that State into competition with older glassmaking centers, that the depletion of hardwood forests outside the South is accelerating the demands upon the long-leaf pine region centering in Louisiana and shifting the median point in furniture manufacturing from the Great Lake peninsula to the vicinity of the hardwood forests of North Carolina, Tennessee, West Virginia and Kentucky, and that the potentialities of cottonseed as a source of feedstuff for cattle is bringing the meat-packing plants from the middle West to the South.

It is not surprising, therefore, to note that, both as to capital and as to the value of products, the advance of the 14 Southern States is at a much more rapid rate than that for the country as a whole. In the period under review the increase in the amount of capital invested in factories in the whole country was from $8,978,825,200 to $12,686,265,673, or $3,707,440,473, equal to 41.3 per cent., and in the South from $950,506,709 to $1,577,437,089, or $626,930,380, equal to 65.9 per cent., while the increase in the value of products in the whole country was from $11,411,121,122 to $14,802,147,087, or $3,391,025,965, equal to 29.7 per cent., and in the South from $1,223,319,051 to $1,769,617,166, or $546,298,155, equal to 44.6 per cent.

The increases in the value of the products of the Southern States were at greater rates than the average rate for the whole South and far above the rate for the whole country, a promise of what the South is yet to do.

Tennessee.

Industries.	Capital. 1900.	Capital. 1905.	Products. 1900.	Products. 1905.
Flour and grist mills	$4,997,169	$6,927,155	$19,161,398	$25,350,758
Lumber and timber	9,616,128	16,638,882	16,709,104	21,580,120
Foundry and machine shops	3,768,565	5,516,453	4,479,489	6,946,567
Railroad car shops, etc.	1,319,628	2,028,941	3,113,053	5,839,445
Printing and publishing	3,602,397	4,408,584	3,455,053	5,063,580
Planing mills, etc.	1,343,381	3,152,596	2,323,247	4,586,918
Cottonseed mills	1,996,791	2,913,999	2,980,041	3,743,927
Leather	3,444,197	4,013,289	2,802,117	3,583,871
Cotton goods	3,767,726	5,113,372	1,994,935	3,560,984
Iron and steel	5,251,596	5,688,293	4,693,215	3,428,049
Furniture	951,756	2,779,903	1,106,623	3,238,248
Clothing, men's	747,650	1,281,363	1,631,075	2,961,581
Fertilizers	950,397	3,381,073	1,466,238	2,700,561
Patent medicines, etc.	738,750	1,262,564	1,503,622	2,680,610
Woolen goods	2,399,518	2,309,772	1,517,194	1,706,396
Hosiery, etc.	216,950	1,159,989	396,150	1,627,823
Total	$45,112,598	$68,576,218	$69,331,604	$98,599,438

Texas.

Industries.	Capital. 1900.	Capital. 1905.	Products. 1900.	Products. 1905.
Flour and grist mills	$3,982,811	$7,785,339	$11,948,556	$22,083,136
Cottonseed mills	7,986,962	14,179,688	14,005,324	18,698,815
Lumber and timber	11,900,657	18,426,242	16,052,966	16,278,240
Slaughtering, etc.	1,232,267	6,374,743	3,904,491	15,620,931
Railroad car shops	3,730,792	4,598,912	8,314,691	10,472,742
Printing and publishing	3,906,168	6,074,319	4,577,110	7,782,247
Foundry and machine shops	2,809,524	4,793,998	2,682,426	4,962,827
Liquors, malt	4,439,012	5,150,308	2,689,606	4,153,938
Saddlery and harness	1,989,784	1,986,407	2,622,664	3,251,525
Bakery products	442,610	1,276,338	1,302,615	3,049,215
Planing mills, etc.	932,860	1,851,386	1,606,297	2,321,423
Manufactured ice	2,563,888	5,140,487	1,184,332	2,083,880
Total	$45,317,335	$77,638,167	$70,890,078	$110,748,929

Virginia.

Industries.	Capital. 1900.	Capital. 1905.	Products. 1900.	Products. 1905.
Flour and grist mills	$3,198,207	$5,503,101	$8,942,198	$13,832,299
Lumber and timber	4,186,405	9,839,646	11,631,539	13,040,860
Tobacco	5,728,357	10,997,474	10,707,766	10,662,268
Railroad car shops, etc.	1,733,389	2,740,078	6,277,279	8,693,948
Cigars and cigarettes	780,261	12,480,175	4,843,641	6,105,936
Leather	4,032,387	4,635,224	4,716,920	5,829,812
Iron and steel	6,686,696	5,269,954	3,341,388	4,859,386
Fertilizers	4,908,381	4,871,810	3,415,550	4,659,281
Cotton goods	4,403,206	7,067,428	2,655,002	4,484,131
Planing mills, etc.	1,618,158	2,688,212	2,686,898	4,224,052
Printing and publishing	2,607,995	3,386,276	2,229,604	3,224,401
Paper and pulp	2,281,903	5,517,200	850,386	3,034,395
Hosiery, etc.	978,575	715,530	1,498,066	2,107,902
Woolen goods	783,527	1,046,094	627,581	1,249,786
Total	$45,927,447	$76,758,202	$69,424,618	$86,007,257

West Virginia.

Industries.	Capital. 1900.	Capital. 1905.	Products. 1900.	Products. 1905.
Lumber and timber	$7,067,945	$12,442,475	$10,190,118	$14,933,472
Iron and steel	7,122,357	8,716,170	13,394,911	13,454,802
Flour and grist mills	1,429,378	2,622,906	3,792,629	6,200,291
Leather	5,049,615	8,750,696	3,210,753	6,061,509
Glass	1,338,084	4,299,880	1,871,786	4,598,563
Coke	4,452,579	8,063,570	3,529,241	4,174,186
Railroad car shops, etc.	1,040,311	1,054,421	2,943,557	4,120,136
Planing mills, etc.	803,673	2,171,489	1,820,463	3,645,716
Foundry and machine shops	877,401	1,909,269	1,401,852	2,673,770
Liquors, malt	1,714,050	3,556,366	1,113,021	2,145,503
Total	$30,885,393	$53,587,222	$43,268,340	$62,007,948

Four Years' Factory Progress.

States.	Capital. 1900.	Capital. 1905.	Products. 1900.	Products. 1905.
Alabama	$60,165,904	$105,382,859	$72,109,929	$109,169,922
Arkansas	25,384,636	46,306,116	39,887,578	53,864,394
Florida	25,682,171	32,971,982	34,133,509	50,298,290
Georgia	79,303,316	135,211,551	94,532,368	151,040,455
Kentucky	87,995,822	147,282,478	126,508,660	159,753,968
Louisiana	100,874,729	150,810,606	111,397,919	186,379,592
Maryland	149,155,313	201,877,966	211,076,143	243,375,996
Mississippi	22,712,186	50,256,309	33,718,517	57,451,445
North Carolina	68,283,005	141,000,639	85,274,083	142,520,776
South Carolina	62,750,027	113,422,224	53,335,311	79,376,262
Tennessee	63,140,657	102,439,481	92,749,129	137,960,476
Texas	63,655,616	115,664,871	92,894,433	150,528,389
Virginia	92,299,589	147,989,182	108,644,150	148,856,525
West Virginia	49,103,138	86,820,823	67,006,822	99,040,676
Total	$950,506,109	$1,577,437,089	$1,223,319,051	$1,769,617,166
Total United States	8,978,825,200	12,686,265,673	11,411,121,122	14,802,147,087

A REVIEW OF THE COTTON SITUATION.

By Col. Alfred B. Shepperson of New York.

[Written for the Manufacturers' Record.]

The year of 1906 has been one of great prosperity for the agricultural, manufacturing and commercial interests of the country, and especially for the cotton-growers and the cotton manufacturers.

The cotton crop of the season ending August 31 proved to be considerably in excess of general expectations. The demand from spinners was good, and the average price for the season was about two cents per pound more than for the previous season. In New York the highest price of the season for middling uplands was 12.60 cents on December 6, 1905, and the lowest price was 9.80 cents on August 29, 1906, showing a range of 2.80 cents, against a range from highest to lowest prices of 4.65 cents in the season of 1904-1905. The New York quotations are a fair indication of the fluctuations of prices in other American markets. The general stability of prices was largely due to the fact that the crop was not marketed too rapidly for its absorption by spinners at a fair price to the producers. From January 1, 1906, to December 26 the highest price for middling upland cotton in New York was 12¼ cents per pound, and the lowest price 9.60 cents. The commercial crop of the season of 1905-1906 was 11,233,847 bales, against a crop the previous season of 13,654,029 bales. The consumption of cotton by the United States mills during the season is estimated as equal to 4,603,000 bales of 500 pounds net, of which the Northern mills consumed 2,364,000 and the Southern mills 2,239,000 bales. The increased consumption over the previous season was 250,000 bales by the Northern mills and 176,000 by the Southern mills, making the increase of the entire country 428,000 bales of 500 pounds net. These figures represent American cotton only, while 82,683 bales of Egyptian cotton and 17,128 bales of Peruvian cotton were imported during the season and about that quantity consumed. The consumption of Egyptian and Peruvian cotton was chiefly by the New England mills.

During the year ending August 31 the consumption of cotton of all growths by the British mills was equal to 3,766,000 bales of 500 pounds net, being 194,000 more than the previous season, while the continental mills consumed 5,244,000 bales of 500 pounds net, being an increase of 96,000 bales over the preceding season. The increased consumption of European mills was, therefore, 290,000 bales of 500 pounds net and of America and Europe combined 718,000 bales over the season of 1904-1905. The Japanese mills consumed during their season ending June 30, 874,000 bales of 500 pounds net, being 102,000 bales more than the previous year, while the East Indian mills during the same period consumed 1,529,000 bales of 500 pounds net, or 56,000 in excess of the preceding year. The number of working cotton spindles in Europe and the United States on September 1 is estimated as 50,000,000 in Great Britain, 35,500,000 on the continent and 24,600,000 in the United States, showing an increase over September 1, 1905, of 1,500,000 for Great Britain, 500,000 for the continent and 750,000 for the United States. The increase in this country was 250,000 spindles in the Northern States and 500,000 in the Southern States.

The increase in consumption was greater by the American mills than by those of any other country, and the increase in spindles greater than anywhere else except in England.

A comparison of the spindle capacity and consumption of the European and American mills last season with 10 years ago, while showing great progress at home and abroad, is very flattering to the American mills, and especially so to those of our Southern States.

The increase in spindles on September 1, 1906, over September 1, 1896, was 5,100,000, or 11.3 per cent., in Great Britain; 6,150,000, or 20.9 per cent., in the continental mills; 1,800,000, or 13 per cent., in our Northern States, and 6,150,000, or 215.8 per cent., in the Southern States. Within the same period the consumption of cotton had increased 490,000 bales, or 15 per cent., by the British mills; 1,084,000 bales, or 26 per cent., by the continental mills; 734,000 bales, or 45 per cent., by our Northern mills, and 1,399,000 bales, or 167 per cent., by the Southern mills. The increase in spindles of the mills of the entire country was 7,950,000 bales, or 47.7 per cent., and in consumption of cotton 2,133,000 bales, or 86 per cent. It will thus be seen that our country has led all others in the increase in capacity and in the actual consumption of cotton by its mills.

The increased consumption by the Southern mills has been considerably greater in actual bales than in any other country, while the percentage of increase is infinitely ahead of any other section, being 167 per cent., against 45 per cent. in the Northern mills and 26 per cent. in the continental mills.

In the incerase in spindles during the decade the Southern mills show the same actual increase as the continental mills, but in the percentage of increase the Southern mills lead the world with their enormous increase of 215.8 per cent.

While this wonderful progress of the cotton-manufacturing industry of the South should be extremely gratifying to all who feel an interest in the prosperity of the Southern States, it was but the natural result of the great advantages of the South for the manufacture of cotton.

Proximity to the cotton fields insured cheaper cotton by the saving effected in freight charges and the inevitable loss in weight in transportation. Cheaper land, building materials and fuel than elsewhere, together with an abundant and unfailing supply of water-power, were other great advantages possessed by the Southern States.

These were the natural advantages which caused the South's great advance in cotton manufacturing, and they will undoubtedly give continued progress and success hereafter.

Though the mills of every country in the world consumed more cotton last season than ever before, the spindles of the United States and Europe were not run to their full capacity. The estimated average consumption per spindle by the British mills last season was 37.66 pounds, against 36.82 the previous season; by the continental mills 73.86 pounds, against 73.54, and by the United States mills 93.55 pounds, against 87.53 pounds. For the season of 1898-99 the average consumption per spindle was estimated as 38.76 pounds in Great Britain, 74.04 pounds on the continent and 99 pounds in the United States.

In the New England as well as in the Southern mills there was an inadequate supply of skilled labor last season, and the same insufficiency of labor still exists. It is thought that from this cause the United States mills were not operated last season to more than about 90 per cent. of their full capacity. The United States exports of cotton cloth for the fiscal year

ending June 30 exceeded those of the previous year 17,000,000 yards, while the increased exports to China were 23,000,000 yards, showing that the exports to other countries were 6,000,000 yards less than the preceding year. Our total exports of cotton cloth were 711,000,000 yards, of which 498,000,000 yards, or 70 per cent., were exported to China. England exported to China alone in the season of 1905-1906 more cotton cloth than the total exports of the United States to all the world. These facts show the great importance of the Chinese trade in cotton cloths.

The Chinese markets are overstocked with cotton goods for which the demand, and especially for those of American manufacture, is now and has been for several months very limited.

The home demand for the product of the American mills was excellent throughout last season, and the activity still continues at remunerative prices. A number of mills have sold their product for four or five months ahead at full prices.

From the views expressed to me by many prominent manufacturers, I think the consumption of cotton by the American mills for the present season may be about 200,000 bales more than last season, though some valued correspondents think that on account of the shortage of labor there will be no increase. On August 15 the condition of the present cotton crop of 1906-1907 was about 10 per cent. better than that of the previous crop at the corresponding time in 1905. After that date and in September there was too much rain in many sections. Killing frosts occurred as early as October 10 at some points in the Atlantic States, and in the latter part of October in Northern Texas, but it is not thought that they reduced the crop to any considerable extent. In some sections the frosts were beneficial, as they killed foliage and thereby hastened the maturity of the bolls. The rains in the latter part of August and in September and the first part of October retarded the maturing of the bolls, thus making the crop late in maturing and interfering seriously with picking the open cotton.

On account of the storms, the grade of the cotton was lowered where they prevailed, and the crop will contain a much smaller proportion of high grades and larger proportion of low and undesirable grades than usual.

Since October 10 the weather in most sections has been exceedingly favorable for maturing the bolls and picking the crop.

The average weight of bales is heavier than to the corresponding time last year, and the average weight per bale for the season will probably be six or seven pounds more than that of the season of 1905-1906. The Department of Agriculture estimated the acreage as 28,686,000 acres, but the probability is that it was fully 31,000,000 acres. Every census report has shown the acreage estimates of the Department of Agriculture to have been far below the figures of the actual enumeration made by the census office.

Estimates of the crop range from 11,000,000 to 14,000,000 bales. The following are some of the estimates which have been issued:

The average of 161 members of New York Cotton Exchange, 12,457,000 bales.

The average of 148 members of Liverpool Cotton Exchange, 12,443,000 bales.

The average of 127 members of Memphis Cotton Exchange, 12,682,596 bales.

The average of 46 members of Yazoo City Cotton Exchange, 11,996,000 bales.

The average of 108 members of Havre Cotton Exchange, 12,708,000 bales.

The average of 100 members of Savannah Cotton Exchange, 12,183,546 bales.

Messrs. Neill Bros. of London, 13,000,000 to 13,500,000 bales.

The New Orleans *Times-Democrat* (exclusive of linters), 12,450,000 bales.

Messrs. Latham, Alexander & Co., New York, 12,150,000 bales.

Messrs. A. Norden & Co., 11,250,000 bales.

Mr. Theo. H. Price, 11,750,000 bales.

Southern Cotton Association (exclusive of linters), 11,146,000 bales.

Mr. Arthur J. Buston of Liverpool, 13,000,000 bales.

Newburger Cotton Co. of Grenada, Miss., 13,775,000 bales.

Messrs. Dennis Smith & Co. of Memphis, Tenn., 13,000,000 bales.

United States Department of Agriculture (exclusive of linters), 12,546,000 bales.

Reliable advices indicate an increased consumption this season over last season of 1000 bales of 500 pounds net weight per week by the British mills and 2000 bales per week by the continental mills, making 156,000 bales for all of Europe.

The cotton crops of India, Egypt and the Asiatic provinces of Russia promise to be considerably larger than last season. Such progress has been made in the cultivation of cotton in Bokhava, Khiva, Ferghana and the other Russian provinces that they now produce 50 per cent. of the cotton required by the Russian mills. The cotton is all grown by irrigation, and its production is stimulated by a tariff tax of four cents per pound on all cotton imported into Russia.

East Indian cotton is now much more carefully handled by the cultivators than in former years, and consequently the grade is higher and the waste in spinning less. This improvement is due to the higher prices which have ruled and to the greater extent to which India cotton has been used by European spinners in place of American cotton.

In view of the quantity of cotton to be received in Europe from India, Egypt and other sources, and considering also the grade of our crop and the increased weight of bales and also the insufficiency of labor to work the American mills to their full capacity, I think the world's spindles will consume during the present season of 1906-1907 about 12,300,000 bales of American cotton.

The present indications are that the commercial cotton crop of the United States will be fully 12,750,000 bales, including linters. The grade of the crop is much lower than last season, but the staple is generally good. High grades of cotton will probably command a large premium throughout the season.

The American crop will doubtless be amply sufficient for the requirements of spinners and leave the combined supply in the world's markets and mills larger at the close of the season than at its opening. The stocks, however, will undoubtedly have a larger proportion than usual of the lower grades of cotton.

In view of the active and profitable business done by spinners on the basis of about 11 cents per pound for middling, it is thought that fairly remunerative prices for the cotton-growers will rule throughout the season.

New York, December 26.

Where the World Will Meet on Southern Soil.

By Hon. H. St. George Tucker.
President of the Jamestown Exposition.

[Written for the Manufacturers' Record.]

The plan and scope of the Jamestown Exposition are so broad and comprehensive and its ramifications are so numerous and of such vital importance that to write an article covering all within a limited space requires a faculty for condensation that I fear I do not possess. Volumes might be written on the subject and yet not the half that would both interest and instruct be told. So broad is the plan and so comprehensive is the scope that nothing is omitted that should be represented and nothing is elaborated beyond the degree that its importance merits. This is a broad claim, but I feel justified in making it, because I believe that the verdict of the press and public when the exposition has become a matter of history will verify the claim.

The plan evolved and developed after the most mature and careful consideration is to fittingly and appropriately celebrate and commemorate the three hundredth anniversary of the first English settlement on the American continent. And the fact that this little band of hardy English pioneers, swayed by the storms of adversity and harassed and besieged by hordes of savages, grew and developed into what was then the most powerful and the richest of the mother country's foreign possessions, and finally, through years of untold privations and fields of carnage from Lexington to Yorktown, into the United States of America, gave birth to the idea of making the Jamestown Exposition a national affair, the more so because around the site selected for the exposition are clustered so many points of historic interest—points where transpired events that mark the most prominent epochs, not only in the history of America, but in the history of the world, and that directly and indirectly had their influence on the destinies of almost every civilized nation and upon the islands of the sea.

AUDITORIUM AT JAMESTOWN EXPOSITION.

In the evolution of the plan it was decided to invite Government participation that in addition to the historic, educational, scientific and commercial features of the exposition, there might be added the new and novel feature of naval and military display and maneuvers. The matter was accordingly laid before the President and Congress, with the result that a bill was passed and approved by the President providing for not only a national, but an international celebration of the three hundredth anniversary of the first English settlement in America, and to defray the Government's share of the expenses Congress then and in a subsequent amendment to the bill appropriated $1,750,000. Congress also authorized the President of the United States to make proclamation of said celebration and to invite foreign nations to participate by the sending of their naval vessels and such representatives of their military organizations as they may deem practicable, and also to invite participation in said celebration by the militia of the several States, but at their own expense. Thus the original plan of the promoters was approved and broadened beyond their most sanguine expectations.

In response to the President's invitation the following nations have declared their intentions to participate with their best war vessels and military officers or troops: Great Britain, Germany, France, Russia, Japan, Italy, Switzerland, Denmark, Venezuela, Mexico, Costa Rica, Guatemala, Argentine Republic, Haiti, Belgium, Dominican Republic, Ecuador, Chili, Bolivia, Brazil, and it is certain that others will yet join in the military pageantry and naval maneuvers.

Aside from the naval and military participation of the Government, there will be exhibits from the State Department, Treasury Department, War and Navy, Signal Service, Department of Justice, Postoffice Department, Department of the Interior, the Smithsonian Institute, the Library of Congress, Department of Agriculture, the Bureau of Entomology, Department of Commerce, and, in fact, from every department of the Government.

But the various nations named have not only accepted the invitation to participate in the military and naval pageantry, but from them and from almost every nation on earth come demands for space in which to exhibit their products from field and mine and factory, as well as to show the progress they have made in education, in art and in science, and to lay before the world the pages of their history. From far-away India and from the islands of the seas these demands are coming in, and the present indications are that the acme of success in all the word implies will be reached in the Jamestown Ter-Centennial Exposition, which will be held on Hampton Roads, near Norfolk, Va., from April 26 to November 30, 1907.

So much has been said of the many points of historic interest that cluster around the site of the Jamestown Exposition that a passing notice here will suffice. Washington and Richmond, but a few short years ago the governing points of the two most formidable forces that ever met upon the field of battle, are but a short distance away, while Yorktown and Appomattox, that mark the most important epochs in the history of the North American continent, if not in the history of the world, are in close proximity to the exposition grounds, and the many monuments all over Tidewater Virginia that

solemnly point heavenward are grim but silent reminders of the cost of the conflict.

Some 40 years have glided by since the smoke of battle cleared away, and the monuments of industry and material prosperity are casting their shadows upon the erstwhile fields of carnage, where now the golden harvests yearly yield a rich reward for honest toil. It is a coincidence worth remarking that the final triumphant struggle for liberty and for union should have taken place so near the spot where first the seeds of liberty were sown and the bonds of union formed, yet so it is.

BIRD'S-EYE VIEW OF JAMESTOWN EXPOSITION.

The grounds of the Jamestown Exposition now, after several extensions necessitated by the constant demand for more space, comprise about 500 acres, with two and a half miles front on Hampton Roads, where all the naval maneuvers will take place, as well as the contests of other nautical craft, are all that heart could wish or the art of landscape gardening devise, and are a fit setting for the group of palatial exhibit structures and elegant State buildings.

The colossal task of the Exposition Company to design and beautify the grounds and construct and furnish the numerous magnificent exhibit and other buildings, with the multiplicity of details incident to the work, is being completed with dispatch heretofore unknown in exposition work. Of course, we have the advantage of weather that permits outdoor work the year round and absence of labor troubles that have, in some instances, harassed other expositions, and in consequence of this there is now no doubt that everything will be in readiness for the gates of the exposition to swing open on schedule time.

Local and through transportation lines are making ample arrangements to safely and expeditiously transport the millions who will attend to and from the exposition, as well as to the many points of interest immediately surrounding Hampton Roads. And it may not be out of order to say that, with the cities of Norfolk, Portsmouth, Newport News and the numerous smaller towns and summer resorts in close proximity to the exposition grounds, and all of them wide awake to the duty that devolves upon them of taking care of the crowds that will be here during 1907, there will be no lack of food and shelter. Further than this, the well-known hospitality of the South is manifest in the fact that many of the private homes will be thrown open to the public during the exposition.

The demand for space for exhibits in almost every conceivable line of industry, coming as they do from every industrial center on the continent and from many in foreign countries, show that the vast scope and importance of the Jamestown Exposition is understood and the value from a commercial point of view is appreciated. The wide publicity the exposition is receiving through the well-directed efforts of our press bureau and the liberality of the press throughout the entire country, and the fact that within 1- hours' ride of the exposition grounds there are 21,000,000 people, and within 24 hours' ride there are 39,000,000, or over half the population of the United States, are good grounds for the hope and expectation that the attendance next year will break all present records. This is made more probable in view of the fact that there now prevails such a degree of general prosperity as has never before been known in the history of the country.

Another vital factor in the basis for calculating attendance is the transportation facilities. In this the Jamestown Exposition has a decided advantage over any other exposition that has ever been held. There are verging at the Jamestown Exposition grounds and immediate vicinity six trunk lines and three short lines of railroad, and of water routes three Atlantic coast lines, four Chesapeake bay lines, four river lines and three river and canal lines. These reach or penetrate every section of the United States, and within the 24-hour radius will bring the people virtually from their very doors to the exposition at a round-trip rate that will be but a fraction over the price of the regular fare one way, while a number of steamship lines reach almost every foreign port of any consequence, and from present indications, owing to the fact that so many foreign nations will participate in the naval and military maneuvers and drills, will bring many thousands here from abroad. But the ready means of transportation from foreign countries to the Jamestown Exposition, and the fact that so many foreign nations will participate in the naval and military pageantry, are not the only factors that will induce attendance from abroad. The applications for space in the exhibit department of the exposition that are coming in from centers of industry in distant lands, even from far-off India—countries that have never before been represented in any exposition—show that the interest in the Jamestown Exposition virtually encircles the globe. And this interest is hailed with grateful satisfaction, at least by those who comprehend its significance. It indicates that there is springing up —in fact, already exists—a spirit of friendly rivalry among nations, scientists, educators, artists and artisans. Other nations have watched the phenomenal progress of America, first with envy that gave place to wonder and admiration, and, by commendable evolution, has begotten a spirit of emulation which has, in turn, gained the strength of competition. They are ready and willing to enter the lists, and in the arena of the world show what they, too, have accomplished during the centuries of their existence.

The eyes of the world have for centuries been focused upon the United States of America, and it has not required a very great degree of acumen to see what inestimable benefit other expositions have been, not only to the immediate sections of the country where they were held, but to the country at large, and, in fact, to the whole world, and they are anxious—yes, determined—to join the phalanx of progression.

This, then, is the plan and scope of the Jamestown Exposition, and even at this early date there is every reason to believe that our most sanguine hopes will be fully realized.

Coal in the United States and Other Countries.

By Edward W. Parker of the United States Geological Survey.

[Written for the Manufacturers' Record.]

"How long will the coal supply of the United States last?" is a question not infrequently asked, and when one considers the enormous and almost continuously increasing drafts that are being made each year upon these rich deposits in Nature's bank, the question is not an unnatural one. During the calendar year 1905 the coal production of the United States reached within 2 per cent. of 400,000,000 short tons, and a conservative estimate of the output for 1906 might readily place it at 425,000,000 short tons. The bulk represented by this great tonnage is difficult to comprehend. Suffice it to say that the trains of cars necessary to transport it, if put together, would extend across this continent no less than 25 parallel lines, or would encircle the globe three times at the equator.

Of this production in 1906, approximately 63,000,000 long tons, or 70,560,000 short tons, were Pennsylvania anthracite, which compared with the output of 77,659,850 short tons in 1905, shows a decrease of about 7,000,000 short tons, or about 9 per cent. This decreased production in 1906 was due to the fact that mining operations were practically suspended during all of April and the first part of May, pending the settlement of the wage scale. This was finally accomplished by the extension of the award of the Anthracite Strike Commission (which expired March 31) for another term of three years. The suspension did not result in any notable inconvenience to consumers, for in the latter part of 1905 and the first three months of 1906 production was pushed to the utmost and large amounts of coal were stored not only by operators, but by dealers and consumers, and these stocks were sufficient to supply the demand during the four or six weeks during which operations were suspended.

Mining operations in some of the bituminous fields were also interfered with during the spring of 1906, particularly in what is known as the competitive fields of Western Pennsylvania, Ohio, Indiana and Illinois, because of contentions over the adjustment of the wage scale and hours of labor, and production during April and May was materially reduced in consequence. The output of bituminous coal for 1906 will probably amount to 330,000,000 tons, against 315,259,491 short tons in 1905. The total production in 1906 may be estimated at about 400,000,000 short tons. Except for the suspensions in April and May, it would probably have reached a total of 425,000,000 tons.

The development of the coal-mining industry in the United States has been veritably by leaps and bounds, and this has been particularly true during the last 25 or 30 years, and is illustrated by the accompanying chart (Fig. 1), in which the yearly production since 1846 is represented by the irregular curve, while the average annual production for every five years is shown by the columns. It will be observed that once in each five years since 1865 there has been one year in which a decreased production is shown. These accidental breaks in the general forward movement are eliminated when the averages are taken. The rapid increase during the last quarter of a century is scarcely less than wonderful. Few persons realize that the increase alone in the average production during the last five years over that

of the five years from 1896 to 1900 is considerably larger than the average yearly production from 1881 to 1895, only 20 years before. The increase in 1905 over 1900, five years before, was larger than the entire production in any year prior to 1887. Since 1890, when the writer took charge of the preparation of the chapter on coal production for the United States Geological Survey, the yearly output has increased more than 150 per cent.

The fact is that in each decade of our recent history the output of our coal mines has practically equaled the entire production to the beginning of that decade. Indeed, it is only in the last 10 years that the decennial production has not exceeded the aggregate previous output. This is diagrammatically shown in Fig. 2. These figures mean that in order to transport this product the railroad companies have had to double their motive power and cars engaged in this traffic every 10 years, in addition to repairs and to replacement of equipment destroyed, and when this is considered it does not appear strange that car shortages such as are at present the ground of numerous complaints should occasionally occur.

How long will this continue? It would appear at first sight that curves joining the upper ends of the production columns shown in Figs. 1 and 2 would exhibit a constantly augmenting height with the end nowhere in sight—to infinity, in fact—for the amount of increase each 5 or 10 years has been much larger than any preceding like period. The amount of increase in the 10 years from 1896 to 1905 over the preceding decade (1886-1895) was equal to the total production in the 20 years from 1866 to 1885. But while this amount of increase in each 5 or 10 years has been steadily growing, there has been a decreasing tendency in the ratio of increase. It is by no means safe to predict what is going to happen, and the statistician who attempts to foretell the future is getting on dangerous ground and jeopardizing his reputation. His safety lies in accurately determining what has been and in letting the future take care of itself. About 10 years ago the writer hazarded the opinion that before the close of the nineteenth century West Virginia would have supplanted Illinois as the second coal-producing State, but up to the close of 1905 Illinois still held second place, though, it is true, by a very narrow margin.

It is interesting to contemplate, however (not to predict), what might occur if the production of coal continued to expand during the next 100 years as it has during the last half-century. The average annual production from 1856 to 1865 was 17,400,000 short tons. In the next decade the average yearly production was 42,000,000 tons, showing an increase of 141 per cent. The next 10 years, 1876-1885, showed an increase of 100 per cent., the average production amounting to 85,000,000 tons. From 1886 to 1895 the average production was 153,600,000 short tons, and from 1896 to 1905 it was 283,000,000 short tons, the percentages of increase being 87 and 78, respectively. Now, if this condition were to continue with the decreasing ratio in the percentage of increase, it would appear that at the end of the next two years our coal production will have reached an annual production of 472,000,000 tons. By the end of 1935 it will have exceeded 1,000,000,000 tons yearly, have added another 1,000,000,000 tons by 1965, will have passed the 2,500,000,000 mark by 1985, and at the end of 2005, a century hence, it will have become approximately constant at about 2,600,000,000 tons yearly. (See Fig. 3.) It is doubtful if there is anyone, however, who would hazard the prediction that this tonnage, or one-half of it, would be reached by that date, or ever. At the same time no one would have predicted in 1855, when the production of coal was 13,000,000 tons, that the output in 1905 would be 393,000,000 tons, or more than thirty times as large.

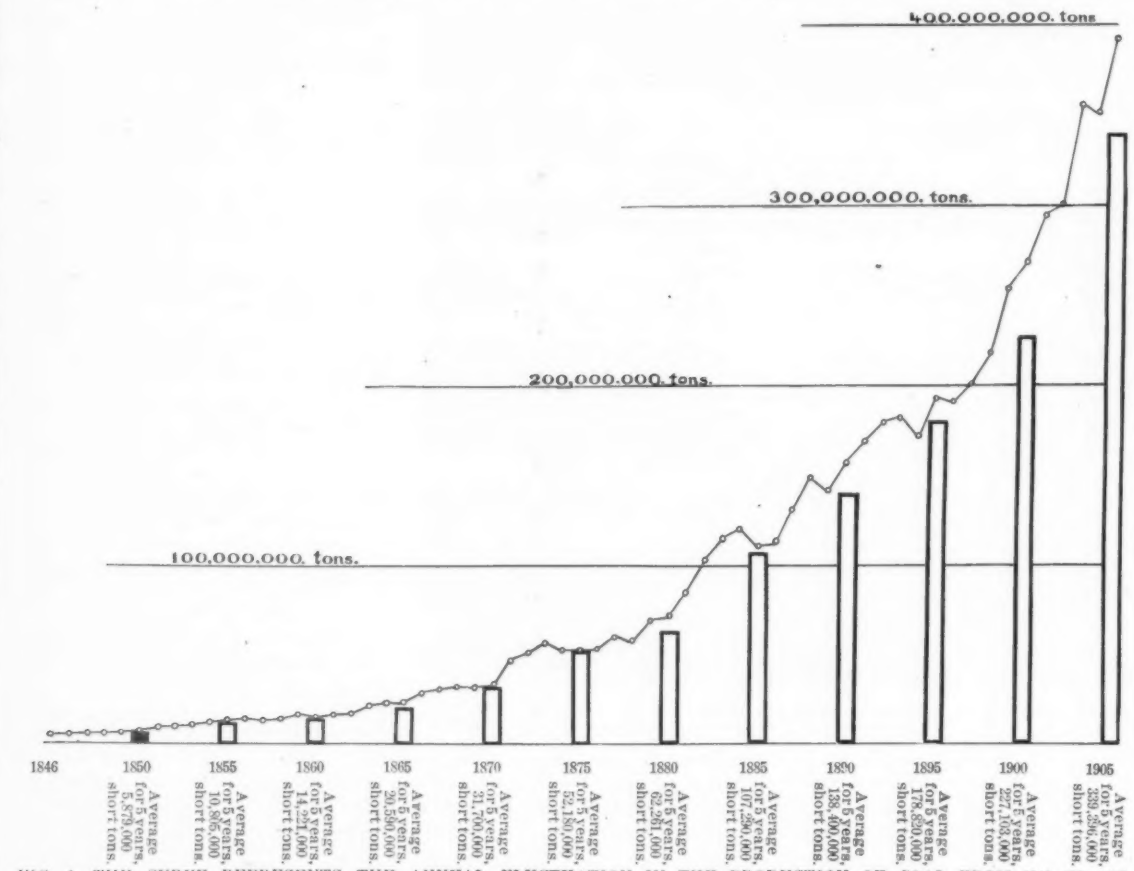


FIG. 1.—THE CURVE REPRESENTS THE ANNUAL FLUCTUATION IN THE PRODUCTION OF COAL FROM 1846 TO 1905. THE COLUMNS SHOW THE AVERAGE ANNUAL PRODUCTION BY FIVE-YEAR PERIODS.

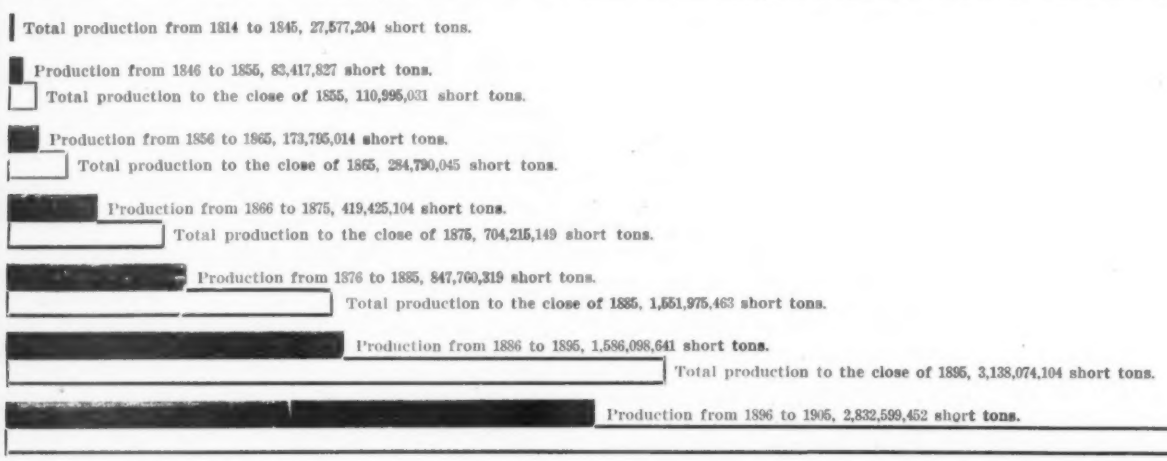

Total production from 1814 to 1845, 27,577,204 short tons.
Production from 1846 to 1855, 83,417,827 short tons.
Total production to the close of 1855, 110,995,031 short tons.
Production from 1856 to 1865, 173,795,014 short tons.
Total production to the close of 1865, 284,790,045 short tons.
Production from 1866 to 1875, 419,425,104 short tons.
Total production to the close of 1875, 704,215,149 short tons.
Production from 1876 to 1885, 847,760,319 short tons.
Total production to the close of 1885, 1,551,975,463 short tons.
Production from 1886 to 1895, 1,586,098,641 short tons.
Total production to the close of 1895, 3,138,074,104 short tons.
Production from 1896 to 1905, 2,832,599,452 short tons.
Total production to the close of 1905, 5,970,773,571 short tons.

FIG. 2.—PRODUCTION OF COAL IN THE UNITED STATES BY DECADES SINCE 1846, COMPARED WITH THE TOTAL PRODUCTION FROM THE EARLIEST TIMES TO THE CLOSE OF EACH DECADE.

Mr. M. R. Campbell of the United States Geological Survey has estimated that the total area in the United States underlaid by workable coal is 338,000 square miles. This is equivalent to 216,320,000 acres. Mr. Campbell also estimates that the thickness of a single coal bed, which would represent the average workable thickness over the entire area, would be equal to 6½ feet, which, at 1100 feet of recoverable coal per acre-foot, would be equal to 7150 tons to the acre, or for the entire country a supply equal to something over 1,500,000,000,000 tons.

At the rate of production shown by the average tonnage during the last 10 years this supply would last between 5000 and 6000 years, but if the rate of increase shown in the last half-century is to be continued at the rate exhibited in the diagram (Fig. 3), it is easy to see that the time when the coal fields begin to show signs of exhaustion would be put forward to an extent which might appear startling. If the people of the United States fully realized this fact they would be more interested in the economical utilization of their fuel supply than they are at present.

Comparison of the statistics of coal production with the increase in the population of the United States is of interest, particularly when compared with similar statistics of some of the other important coal-producing countries. Fifty years ago the United States was, if not entirely, certainly for the most part, an agricultural country, with manufacturing industries comparatively little developed. Today, without declining as an agricultural country, it is in some lines the most important manufacturing country in the world, and the steps by which this supremacy has been attained are exhibited in the history of coal mining and its relation between the increase in coal production with the growth of population. Going back for a period of a little over 50 years, or to the middle of the last century, and comparing the statistics of coal production with the increased population, it is found that in 1850, according to the United States census for that year, the production of coal amounted to 6,445,681 tons, when the population of the country amounted to 23,191,876 persons. The per capita production of coal in that year is thus seen to have been 0.278 ton. In 1860, or 10 years later, the population was 31,443,321 persons, and the coal production amounted to 14,333,922 tons, or an average of 0.514 ton per person.

At the census of 1870 the population of

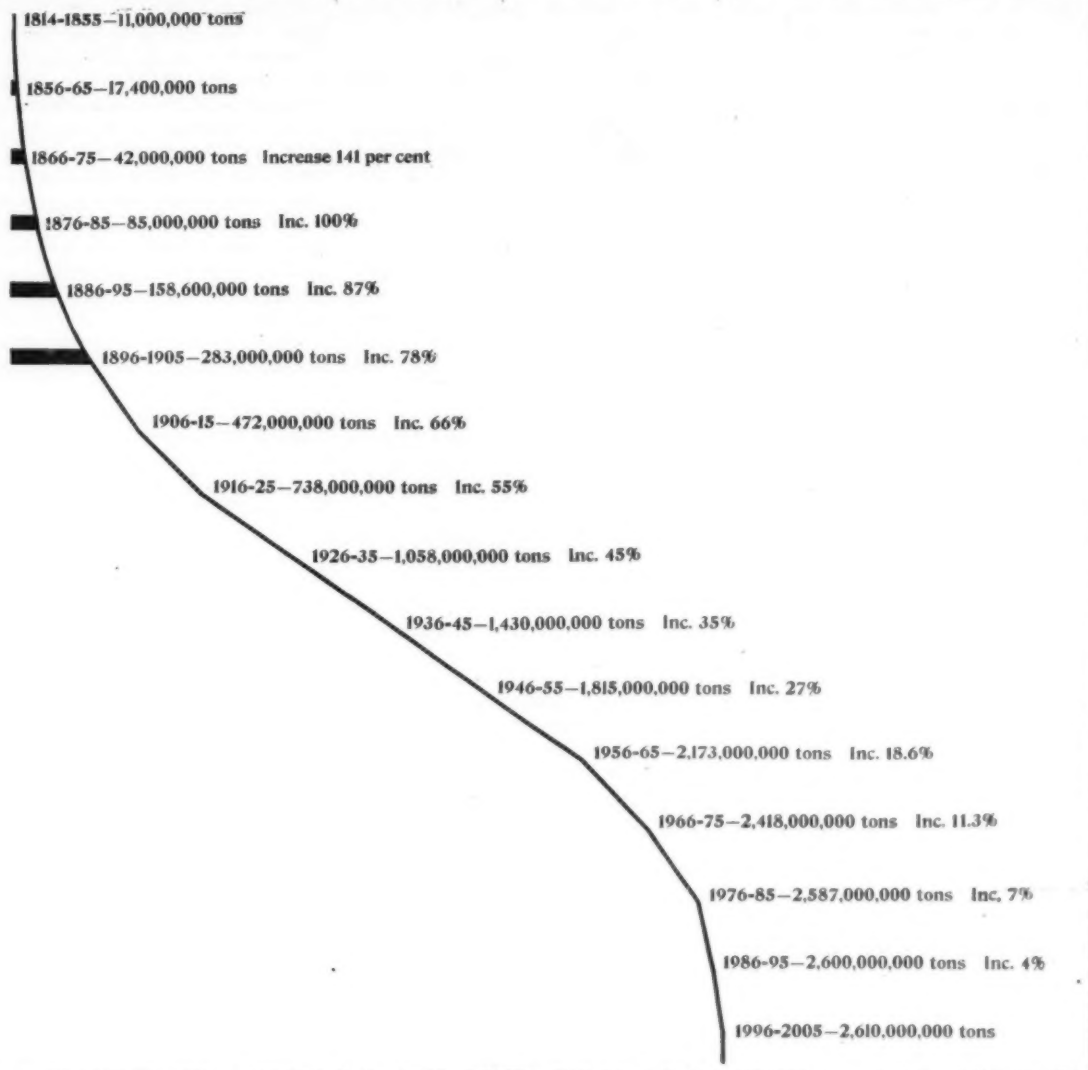


FIG. 3.—INDICATING THE PRODUCTION OF COAL DURING THE LAST HALF CENTURY AND WHAT MIGHT BE EXPECTED IF THE PRESENT RATE OF INCREASING PRODUCTION SHOULD CONTINUE FOR ANOTHER HUNDRED YEARS.

the United States amounted to 38,558,371; the coal production in that year amounted to 33,035,580 short tons, a per capita average of 0.857 tons. Ten years later, when the population was 50,155,783, the coal output amounted to 71,481,570 short tons, or 1.43 tons per capita. In 1890 the population had grown to 62,622,250, an increase of 25 per cent. over 1880, while the coal production had grown to 157,770,963 short tons, or a per capita output of 2.05 tons. At the taking of the twelfth census, in 1900, the increase in population amounted to 21 per cent., the total number of persons reported being 76,303,387, while more than 70 per cent. had been added to the coal production, with a total of 269,684,027 short tons, or an average of 3.53 for each inhabitant. In other words, while the population from 1850 to 1900 has shown an increase of 230 per cent., the production of coal increased 4084 per cent. Estimating the population of the United States in 1905 at 83,000,000 persons, the per capita production for that year is found to have been 4.73 tons.

How these statistics compare with corresponding figures for Great Britain is made possible through some tables recently prepared by Mr. Price Williams, and for which the writer is indebted to Mr. Henry S. Fleming, secretary of the Bituminous Coal Trade Association of New York. Through the courtesy of Mr. Wm. M. Steuart of the Bureau of the Census, figures regarding the population of Germany for a series of years have been obtained, while those for Austria-Hungary, France and Belgium, which rank fourth, fifth and sixth, respectively, among the coal-producing countries of the world, are obtained from "The Statesman's Yearbook."

According to Mr. Williams, the per capita consumption of coal in Great Britain was 3.5233 short tons in 1860, 4.2626 tons in 1870, 4.6972 tons in 1880, 4.8992 tons in 1890 and 5.1062 tons in 1900, the figures being reduced to short tons for convenience of comparison. It should be remembered in making these comparisons that Great Britain exports about 20 per cent. of her coal production, while 97 per cent. of the production in the United States is consumed within our own borders. In the ratio of coal production to its population Belgium ranks next to Great Britain among the European countries, although in the amount of production Belgium is exceeded by Germany, Austria-Hungary and France. The population statistics of Belgium prior to 1880 were taken in 1856, 1866 and 1876, the last named being only one for which the figures of coal production are also obtainable. The per capita production of coal in Belgium in 1876 was 2.96 short tons, in 1880 it was 3.3727 short tons, in 1890 3.576 short tons and in 1900 3.8628 short tons.

Germany, the third in rank among the coal-producing countries and fourth in the production per capita, shows an increase in per capita production more in accord with that of the United States. In 1870, when the production per capita in the United States was 0.857 ton, that of Germany was 0.919 ton; in 1880 the per capita production of the United States was 1.43 tons, while that of Germany was 1.441, and in 1900, when the per capita production of the United States was 3.53 tons, that of Germany was 2.924 tons.

Austria-Hungary has shown an increase in per capita production from 0.2334 ton in 1869 to 1.0053 tons in 1900, and France, whose production of coal for each inhabitant is the smallest of all the countries mentioned, had a per capita production in 1901 of 0.9136 ton, against 0.4917 ton in 1872. France, however, does not depend entirely upon her own mines for her supply of coal, but imports several millions of tons annually, chiefly from Great Britain. In 1901 the exports of coal from the United Kingdom to France amounted to approximately 8,000,000 short tons, which, added to the domestic production of that year, would make the per capita consumption 1.12 tons.

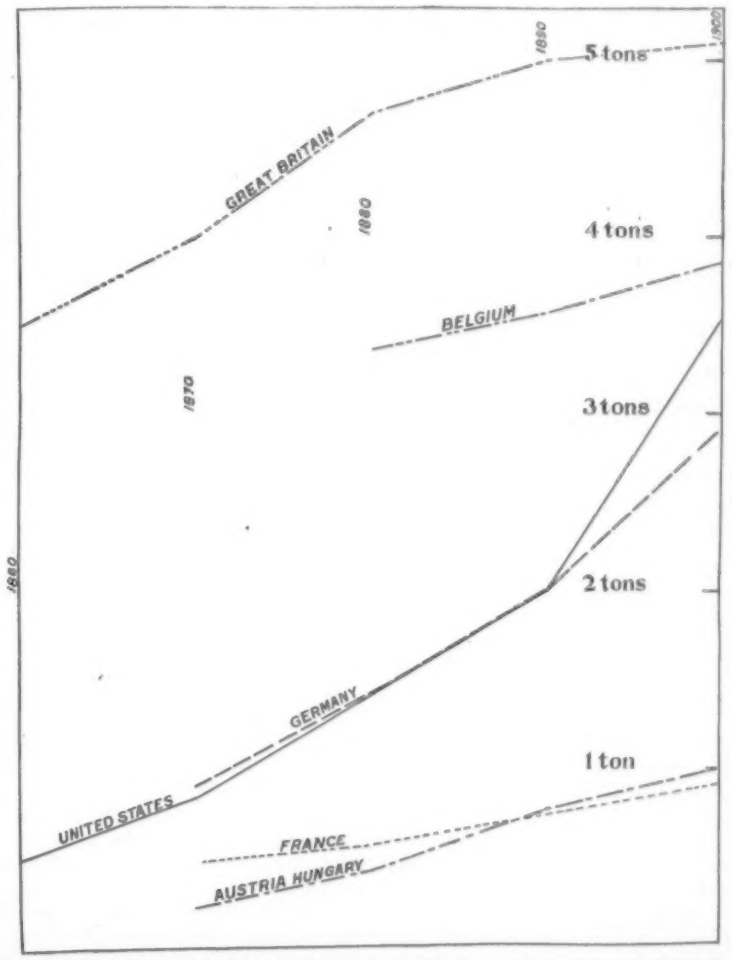


FIG. 4.—PER CAPITA PRODUCTION OF COAL IN THE SIX PRINCIPAL PRODUCING COUNTRIES.

The growth in the production of coal compared with that of the population in the six principal coal-producing countries during the census years for which the statistics are available is graphically illustrated in Fig. 4.

It has been shown that the coal supply of the United States, if drawn upon at the average rate of the last 10 years, would last between 5000 and 6000 years. At the rate of production in 1906 it would be reduced to less than 4000 years, and if a proportionate rate of increase as shown in the last 50 years were to continue the exhaustion would be measured in terms of hundreds instead of thousands. But leaving out all calculation as to future increase, and counting only on the record of the past, we know we would have enough coal left in the United States to last 40 centuries. How this condition compares with some of the other nations of the world may be interesting.

Great Britain is our only real rival, and up to 1898 produced more coal each year than did the United States, though by our great progress in the last few years we have placed Great Britain far behind, and our output in 1905 exceeded that of the United Kingdom by nearly 50 per cent. Great Britain, however, until 1890 the largest coal producer of the world, finds herself now facing at no remote date an exhaustion of her coal fields. The final report of the Royal Commission on Coal Supplies, filed in January, 1905, reported the total available quantity of coal in the proved coal fields of the United Kingdom at no greater depths than 4000 feet at a little less than 101,000,000,000 tons, with one foot of coal as the minimum workable thickness. (To the writer's knowledge the thinnest coal worked in the United States

is 28 inches.) In addition to this, it is estimated that there are 40,000,000,000 tons in the unproved coal fields, making a total of only a little over 140,000,000,000 tons, or less than 10 per cent. of the available supply in the United States. The coal production of Great Britain in the last five years has averaged about 230,000,000 tons, and has been increasing at the rate of about 2½ per cent. per annum for the last 30 years. At the rate of production in the last five years Great Britain's supply would last about 600 years as compared with 4000 years for the United States, but if the present increasing ratios in the two countries were to continue they would probably be exhausted about the same time.

For an estimate of Germany's coal resources the writer accepts one made some months ago by *Stahl und Eisen*, a generally-accepted authority. This estimate places Germany's coal supply at 280,000,000,000 tons—about double that of Great Britain and somewhat less than one-fifth that of the United States. Germany's production in the last five years has averaged about 160,000,000 metric tons, and is increasing at the rate of about 5 per cent. yearly. At the rate of production in 1905 Germany's coal supply would last 1700 years, but with the annual increase continuing this would be reduced to probably 1000 years.

Stahl und Eisen also estimates the reserves of France at 19,000,000,000 tons, Belgium at 23,000,000,000 tons, Austria at 17,000,000,000 tons and Russia at 40,000,000,000 tons. The average production in France for the last five years has been about 33,000,000 metric tons, which would give a life of 600 years to her coal fields. Belgium would last about 1000 years, as her production has been about 23,000,000 tons a year, or a little less, for the last decade. Russia, whose production has not reached 20,000,000 tons during her history, may at this rate look forward to 2000 years of coal production. The estimated supply for Austria does not probably include that of Hungary, while the statistics of production are for the two. If the estimate includes both countries, and the production as for the last few years continues, the fields would be exhausted in 400 years.

Too little is known about the coal fields of Asia and Africa to consider them in an article of this kind. One authority has placed the coal supply of the one province of Shensi, in China, at 1,200,000,000,000 tons, or 80 per cent. of that of the United States. But the authority could just as well have mentioned double the quantity with little fear of immediate contradiction.

In Australia a fairly reliable authority has placed the coal reserves at a total of 150,000,000,000 tons, or about the same as those of the United Kingdom.

But whether the coal fields of the world as a whole will last 500 or 5000 years is a matter of comparatively little import to the present generation, and the writer feels confident that long before the coal is exhausted the more direct utilization of the sun's energy, by harnessing great watercourses and in many other ways the necessity for coal as one of the chief elements in the forward progress of the human race will to a great extent have passed.

THE SOUTH: A NATION'S PLEASURE LAND.

[Special Correspondence Manufacturers' Record.]

Chattanooga, December 29.

The growing attractiveness of the South from the separate standpoints of profit and pleasure has lately presented itself to me from two new angles. The one, relating to the business side, is furnished by an advertisement in the MANUFACTURERS' RECORD, and an editorial comment thereon, in which a Northern concrete construction company announces that during the winter months, when building operations are suspended for a season in the North, the company will devote particular attention to reinforced concrete work in the South, where work can be carried on the year round. The other, affecting the charm of the South as a pleasure resort, was suggested in a talk I recently had with Mr. Herbert Cutler Brown, now of Chattanooga, who made the first automobile trip from the North through to Chattanooga and beyond, and who pointed out that having blazed the way, there should be, with proper encouragement, an interest aroused among the people of the East and North in motor-car touring through the South that might amount almost to a fad. Both of these points seem to me to suggest possibilities of vast development in a way that would confer tremendous benefits, from every point of view, on the people of the North as well as on those of the South.

In the case of the building operations mentioned, the manager of the company points out that such a concern as his can afford to take work during the winter months at a very low rate in order to keep together the large construction organization that is necessary during the months when work at the North must be crowded through with the least possible loss of time. A tremendous advantage Southern manufacturers have over those of the North is pointed out as lying in the fact that extra cost is necessitated because of this crowding of work in order to finish up during the open season of the North, and the builder who must suspend operations during the winter incurs an expense which must be charged in to the factories that can only be built during a certain few months. The Southern manufacturer can thus build cheaper, because operations are not limited to a restricted season, and, better, because he has at his command the services of a construction company whose Northern operations give it the advantage of much experience.

It is easy to predict that when these conditions are generally realized among all the lines of trade in the North which are affected by the restrictions of the winter months, there will be a cultivation of Southern trade greater than the past has known, with benefit to both the North and the South.

While an appreciation of Southern advantages and opportunities exists in the North to an extent never before approached, yet it is a fact that not until one has traveled through the country can any adequate comprehension be had of the almost illimitable possibilities the section contains in well-nigh every way. It is so common an occurrence as to be the rule that anyone who comes into almost any section of the South and makes even the most casual investigation goes back full of enthusiasm over the activity, vigor and development encountered, and profoundly impressed with the opportunities that exist; thus, the more people there are who come into the South every year, either on business or pleasure, the greater the advantage to the South.

So it is not only a matter of immediate benefit to Southern manufacturers wanting factories built to get in the Northern builder who would otherwise be idle during several winter months, but it is of great value in an advertising way to have a lot of Northern visitors of this kind, who will either succumb to the charms of a Southern winter and remain to make it their permanent home, or, if returning North, will carry tidings of the favored land they have seen below the Mason and Dixon line.

It is estimated that 300,000 visitors go to Florida every winter. Many of these are only birds of passage, to be sure, but the great fruit and vegetable development of Florida has occurred since people in increasing numbers have come to know the delights of practically every portion of the peninsular State. New towns are springing up and old ones growing in size, so that all Florida is experiencing a development of the most important kind. Not only is the coast becoming in name and in fact an American Riviera, where the distinguished of this country and abroad gather during the season and bask in the charms of June-like days during the months of winter, but people from the North are cultivating the soil, making permanent homes all over the State and getting rich on the profits of oranges, pineapples, grape fruit, tomatoes and so on. I suppose St. Petersburg is no better known to the country at large than it has been to me, and yet there comes from that little Florida city of 4000 population such alluring literature and such attractive pictures of embowered homes, commodious hotels, smooth beaches and fertile fields that one is tempted to drop everything at once and make a bee-line for this land of pictured beauty, where the comforts of life are to be had almost for the asking, and where nature is ever kind.

But wherever the traveler turns some new object of interest, some distinctive characteristic will challenge his attention and investigation. As far north as Norfolk, where a great city is growing up, and where a rarely beautiful exposition is to be given this year, he will find a most interesting development in industrial and commercial lines, and, at the same time, the further distinguishing Southern features of climate and soil will be impressed upon him when he sees the enormous trucking farms which surround the city and from which fortunes are frequently taken through one year's yield. Down through North Carolina, where strawberries and truck gardening have made hundreds well-to-do; in Georgia, where peaches have brought fame and fortune to entire counties, the interested investigator may go, and he may continue finding new beauties and further opportunities till he passes through the wonderfully fertile lands of Louisiana and on into the great stretch of Texas, whose varieties of opportunities lead on to the very end of the land in the almost tropical richness of the Brownsville district.

No epitome of the South is possible unless it be contained in the statement that it is a land of unexampled possibilities in every line of industry, commerce and the charms of living. All these impress themselves on those who come into the South. This is the advantage in inducing business men and travelers to come in increasing numbers. This is the reason it has seemed to me there was a new and important vista opened in Mr. Brown's suggestion, that proper effort would induce automobiling parties to tour the South in their cars, like they do Europe, and as they have done the East and the North, even to the point of racing across the continent, from New York to San Francisco. While the number who could make these trips would be small in comparison with those who now annually visit Florida or who take trains or boats for the coast resorts of Louisiana; who annually bask in the delights of New Orleans and go on to enjoy the charms of rare old San Antonio, yet there are thousands who would make the motor-car trip to points even so far away as San Antonio is from New York city, provided roads and stopping places were so improved as to make these trips attractive. Make motor touring in the South the fashion and a method of advertising will have been inaugurated which will be of incalculable benefit to the entire section, for every visitation of the outsider is an educational influence of tremendous advantage to the whole country and is of great business value to the South as well.

With an increasing intermingling of the people year by year, and with the increasing population and wealth of the country, there is scarcely any limit to the possibilities before the resort places of the South—the only part of the United States, outside of remote California, which offers a retreat from the rigors of winter, where the birds sing, the flowers bloom, the palms sway in the balmy and incense-laden breezes, where the comforts of living are always at hand and where the wheels of progress are never frozen up.

ALBERT PHENIS.

Mobile, Ala.

Situated at the mouth of the Mobile river, at the head of the Mobile bay, at a focal point of important railroad lines, with excellent river and open water connections, contiguous to large timber, coal and iron regions and a large market for agricultural products, principally cotton, Mobile, Ala., possesses ideal facilities for the location of manufacturing industries. Raw products and materials for this purpose can be accumulated there with much economy and facility. There are already about 200 manufacturing concerns in Mobile, employing many thousands of wage-earners. Its lumber and timber interests are extensive, over 30 sawmills being in the immediate vicinity, with an aggregate cutting capacity of 4,150,000 feet and representing an investment of over $12,000,000. As a seaport the city has enjoyed a remarkable growth. From 1895 to 1905 the increase in imports and exports has been 261 per cent., in value of cotton exports 127 per cent., in value of lumber exports 179 per cent., and in movement of tonnage 129 per cent.

Its transportation facilities are ample and extensive, there being five railroad lines radiating from the city, in addition to many steamboat lines which ply upon the waters of 2000 miles of navigable streams which empty into Mobile bay. There are also 15 steamship lines having direct connection with all parts of Europe, Cuba, Mexico and South America.

These and many other interesting facts are contained in an attractive pamphlet sent out under the auspices of the Mobile Commercial Club and the Chamber of Commerce.

Johnson City, Tenn.

The advantages of Johnson City, Tenn., are covered at length in an industrial edition of the *Tennessee Republican* of that city. The population has increased from 4500 to 9500 people in the last six years, and on account of the many facilities which the city contains as an industrial center the rate of increase in the future is expected to be even greater. Johnson City has all of the improvements enjoyed by other wide-awake cities, and is not only thoroughly alive to every opportunity to encourage its present industries, but is always on the alert to assist others in locating in its midst.

Major W. L. Glessner, commissioner of the bureau of immigration of the Georgia Southern & Florida Railway of Macon, Ga., has issued a convenient pamphlet in which are set forth succinctly the attractions of South Georgia for the agriculturist and the investor.

PETROLEUM IN SOUTHWESTERN FIELDS.

By HOLLAND S. REAVIS,
Editor *Oil Investors' Journal.*

[Written for the Manufacturers' Record.]

Texas and Louisiana in 1906 produced 21,000,000 barrels of crude petroleum, valued at $12,180,000 at the wells. While the combined yield of the two States was greater in quantity in 1904 and 1905 than in the year just closed, the revenue from the output has never been so large as in 1906. In 1904 the production of Texas and Louisiana amounted to 25,200,371 barrels, valued at $9,229,814 at the wells; in 1905 the output was 37,046,605 barrels, valued at $9,153,587 at the wells. In both 1904 and 1905 there was a surplus of production. The Batson field, in Southeast Texas, and the Jennings field, in Southwest Louisiana, flooded the market with fuel oil in 1904, and in the following year Jennings maintained an output of nearly 1,000,000 barrels a month, while a new and very prolific pool was opened up at Humble, in Southeast Texas, yielding 15,594,310 barrels within 12 months. The abundance of oil, however, worked as a depressing influence upon prices, much of the output being disposed of at from 12 to 20 cents a barrel.

This past year has witnessed a reversal of conditions. Instead of a surplus, there has been a shortage in output; in other words, current demands have exceeded current production, with the result that the stocks of oil accumulated in 1904 and 1905, amounting to about 20,000,000 barrels, have been drawn on to the extent of 9,500,000 barrels to supply the excess of requirements over production. As the output has diminished prices have advanced proportionately. At the first of the year the market for Gulf coast crude at the wells ranged from 30 to 40 cents a barrel. The close of the year sees prices firm at 70 and 75 cents a barrel.

The Gulf coast districts, comprising the producing pools in Southeast Texas and Southwest Louisiana, are credited with an output of 20,044,500 barrels in 1906, the balance of the production for the year coming from the Corsicana and Powell fields in Navarro county and the Henrietta field in Clay county, several hundred miles north of the Gulf coast. Petroleum was developed at Corsicana in 1896, but has never been produced in the quantities that have made the Gulf coast region a factor in the world's supply of oil. The entire output of the Corsicana, Powell and Henrietta districts since 1896 has been 6,025,057 barrels, while the Gulf coast districts since 1901 have produced 121,181,262 barrels. From Spindletop alone 35,736,289 barrels of oil have been produced and sold in the last six years; from Sour Lake, 21,073,507 barrels in five years; from Batson, 17,357,096 barrels in three years and one month; from Humble, 19,118,210 barrels in two years; from Jennings, 20,796,608 barrels in five years, and from Saratoga, 6,410,267 barrels in the same period. During the six years that the development of the Gulf coast oil industry has been in progress not less than 5,000,000 barrels of crude petroleum have been consumed on the various fields for fuel under boilers, and of this no account is taken in the net total of 121,181,262 barrels produced and sold. The net value of the Texas and Louisiana oil output to date, amounting to 127,206,319 barrels, is put at $48,794,752 at the wells.

Until 1906 the supply of oil in the Gulf coast region has been replenished each year by the opening up of new and important territory. In 1901 Spindletop furnished the production which formed the beginning of the fuel-oil trade and refining industry in this section. The amount of oil utilized that year amounted to 3,593,113 barrels. In 1902 Jennings added 548,617 barrels and Sour Lake 44,838 barrels to Spindletop's output of 17,420,949 barrels, making the total production 18,014,404 barrels. In 1903 the Sour Lake pool was developed, yielding 8,848,159 barrels, which, added to Spindletop's 8,600,905 barrels, Batson's 4518 barrels, Jennings' 892,609 barrels and 25,192 barrels from other and smaller fields, brought the total up to 18,371,383 barrels. In 1904 Batson supplied the bulk of new production, being credited with 10,904,737 barrels; Spindletop produced 3,433,842 barrels, Sour Lake 6,442,357 barrels, Saratoga 739,239 barrels, Jennings 2,923,066 barrels and other fields 188,028 barrels, constituting a total yield of 24,631,269 barrels. The Humble field, opened up in January, 1905, produced 15,594,310 barrels in that year, the output being augmented by 1,652,780 barrels from Spindletop, 3,362,153 barrels from Sour Lake, 3,125,028 barrels from Saratoga, 3,774,841 barrels from Batson, 8,891,416 barrels from Jennings and 126,065 barrels from other districts—a total yield of 36,526,593 barrels.

Jennings produced more oil than any other Gulf coast field in 1906, its output being 7,540,900 barrels. Humble was next, with 3,523,900 barrels, and, in order, Batson with 2,673,000 barrels, Saratoga with 2,546,000 barrels, Sour Lake with 2,376,000 barrels, Spindletop with 1,034,700 barrels and miscellaneous districts, including Hoskins Mound, Dayton and Matagorda, 350,000 barrels, or a total production of 20,044,500 barrels.

Three new pools that give more or less promise of becoming prolific producers have been developed in the past 18 months. These are the Dayton pool, in Liberty county, about 50 miles west of Beaumont; the Hoskins Mound pool, in Brazoria county, 40 miles south of Houston and near the Gulf coast, and the Caddo pool, in Caddo county, Louisiana, about 230 miles north of Beaumont and about 25 miles north of Shreveport, La. Dayton has been a disappointment, for the reason that no deep sand such as exists in the important Gulf coast pools has yet been developed. Since September, 1905, it has produced 175,000 barrels of oil. The Sun Pipe Line Co. and Security Oil Co. have pipe-line connections with the field, and are running the output. A well was brought in by the Mound Oil Co. at Hoskins Mound at a depth of 582 feet in October, 1905, producing from 2000 to 3000 barrels a day. Since that time it has yielded about 125,000 barrels, and is now making 300 barrels a day. Although other wells have been sunk in the territory adjacent to it, all efforts to secure additional production in this field have failed. A pipe line is in operation between Hoskins Mound and Danbury, a station on the Brownsville Railroad 10 miles distant, and the oil is being shipped in tank cars for fuel use. At Caddo a flowing well was drilled in at a depth of 2160 feet in October, 1906. A pipe line has been laid by the Louisiana Company a distance of two miles to the Kansas City Southern Railroad, and shipments of oil are now being made from Caddo City. Three additional wells are going down in this territory, any one of which may develop a sand of importance. The present well is producing about 250 barrels a day.

The failure to develop a prolific pool on the Gulf coast during the past year does not mean that the industry in future will be dependent for its supply upon the older fields, whose output is gradually diminishing. The situation is similar to that which existed in the early months of 1903, when, with Spindletop's output declining from month to month, the price of oil advanced to 83 cents. At that time there were many who predicted that the Gulf coast oil industry would die out as the Spindletop wells became exhausted. Yet since then the supply has been replenished from year to year by the discovery of new sources of production—Sour Lake, Saratoga, Batson, Humble and Jennings. There is every reason to believe that the entire Gulf coast is dotted with pools of oil as prolific as those which already have been found. To locate them requires patient and persistent drilling. Dozens of test wells are going down in the Gulf coast region. The drill may reveal one or more new pools any day.

Two of the interests which have large investments in refineries in Southeast Texas—the Gulf Refining Co. and the Texas Company—are preparing to obtain a supply of the high-grade crude produced in the Indian Territory field, and to this end have made arrangements to lay eight-inch pipe lines from the Glenn pool, 15 miles south of Tulsa, I. T., to connect with their Southeast Texas pipe-line systems. Each of these two projects involves an outlay of not less than $5,000,000. The surveys are now being made for the lines, and material is on the way from the East with which to begin construction. Work has already started on 17 55,000-barrel steel tanks for the Gulf Pipe Line Co. (associated with the Gulf Refining Co. and J. M. Guffey Petroleum Co.) in the Glenn field, and the Texas Company will begin the erection of 10 37,500-barrel steel tanks in the Glenn district in January. Both companies have opened offices in Tulsa, and the Texas Company has also established offices at Dallas, Texas, from which point the construction of that company's line will be directed. The length of the lines will be approximately 450 miles each, the Gulf line connecting at Sour Lake with the lines terminating at Port Arthur, where the Gulf Refinery is located, and the Texas Company's line joining the present system at Humble, thereby forming a through trunk line from Tulsa to deep water at Port Arthur. The Texas Company has a refinery at Port Arthur and another at Port Neches, a few miles south of Beaumont, on the Neches river. It will require 8 to 12 months to complete the lines.

The capacity of the five refineries in Southeast Texas is put at 27,000 barrels of crude oil a day. It seems probable that this capacity will be increased by 6000 to 8000 barrels before the end of 1907. During the past year it is estimated that the refineries in this section treated 8,000,000 barrels of crude, all of which was of the heavy variety produced in the Gulf coast region. The Territory oil contains much greater values for refining than the Gulf coast product. Where 2 per cent. of gasoline may be obtained from the Gulf coast crude, the Territory oil will yield 10 and 12 per cent. The yield of kerosene from the Territory crude also is much greater, ranging from 19 to 23 per cent., against 13 to 15 per cent. from Gulf coast oil. With the refineries obtaining the bulk of their supply from Indian Teritory, there will be more heavy crude available for fuel use in Texas and Louisiana. Thus both the output of refinery products and the sale of fuel oil will be increased. No limit may be put upon the possibilities of the refining industry in Southeast Texas when an adequate supply of the high-grade Territory crude has been secured by the construction of the pipe lines that are to be completed during the coming year. The location of the refineries is ideal, being at tidewater, giving them a free outlet for their products to the markets of the world. In 1905 the shipments of refinery products from Southeast Texas through Port Arthur and Sabine amounted to 3,887,091 barrels, valued at $7,774,182. In 1906 the quantity was increased to 4,282,982 barrels and the value to $10,707,425. Texas refinery products go to all the Southern States, to Atlantic coast points and to Europe. The business has grown from year to year, and with light crude as a basis for operations it is not to be doubted that the refining industry in this section will rank with that of the greatest refining centers in America.

The shipments of all grades of Gulf coast petroleum (excepting refinery products in tank cars) in 1906 amounted to 25,590,292 barrels, having an estimated value of $25,344,847. Rail shipments of crude to fuel-oil consumers constituted more than one-half of the entire movement, amounting to 13,042,131 barrels, a decrease of 1,497,967 barrels as compared with 1905. Shipments of crude by vessel from Sabine, Port Arthur, Plaquemine and Port Neches amounted to 8,265,179 barrels, indicating an increase of 465,625 barrels in this item as compared with 1905. Shipments of refinery products from Port Arthur and Sabine amounted to 4,282,982 barrels, indicating an increase of 395,891 barrels as compared with 1905. The total movement of all grades (excepting refinery products in tank cars, of which no records are available) showed a decrease of 636,181 barrels as compared with the previous year, but, on account of the higher scale of prices prevailing in the past 12 months, the estimated value of the shipments exceeded that of 1905 by $9,408,940.

The growth and importance of the oil development which has occurred in the West and Southwest since 1900 are aptly illustrated by a reference to the percentages of the total production of petroleum east of the Mississippi river as compared with the production west of the Mississippi river in this period. Up to and including 1875 Pennsylvania furnished all of the oil produced in the United States. In that year the output was 8,787,514 barrels. During 1876 West Virginia produced 120,000 barrels, Ohio 31,763 barrels and California 12,000 barrels, this last-mentioned being the first production recorded west of the Mississippi. Pennsylvania, West Virginia and Ohio increased their output, and in 1891 their combined yield exceeded 53,000,000 barrels, while the territory west of the Mississippi produced less than 1,000,000 barrels. With the addition of Indiana the Eastern fields in 1896—the year that oil was developed at Corsicana, Texas—attained their maximum production of nearly 60,000,000 barrels, while the Western fields were credited with 1,600,000 barrels. Beginning in 1900, the Western fields began to show in a modest way in the percentage column. In that year the Eastern fields produced 58,000,000 barrels, or 91.25 per cent. of the total yield of the United States, while the Western States produced 5,200,000 barrels, of which California was credited with 4,324,484 barrels, Texas 836,039 barrels and Kansas and Indian Territory 81,186 barrels, the entire Western output constituting 8.24 per cent. of the total. Spindletop became a factor in 1901, and the Western fields were credited with 19.26 per cent. of the entire yield, while the Eastern fields supplied 80.06 per cent. In 1902 the output in Texas rose to 18,083,658 barrels, in California to 13,984,268 barrels, and the Western fields began to loom up large upon the map of the oil world, with 37.16 per cent. of the total yield to their credit,

while the Eastern fields furnished 62.38 per cent. of the total. In 1903 California produced 24,382,472 barrels, Texas and Louisiana 18,873,343 barrels and Kansas and Indian Territory 1,071,125 barrels. The output of the Western fields in this year constituted 44.03 per cent. of the total, while the Eastern fields were credited with 55.38 per cent. The Western fields for the first time produced more oil than the Eastern States in 1904, when Texas and Louisiana increased their output to 25,200,371 barrels, California to 20,649,434 barrels and Kansas, Indian Territory and Oklahoma to 5,617,527 barrels, their combined output forming 51.65 per cent. of the total, against 47.91 per cent. supplied by the Eastern fields. In 1905 the Western fields produced the enormous quantity of 82,500,000 barrels—13,000,000 barrels more than the output of the entire United States as late as 1901, and within 5,500,000 barrels of the total output in 1902. Texas and Louisiana furnished 37,046,605 barrels, California 33,427,473 barrels and the mid-continent field (Kansas, Indian Territory and Oklahoma) 12,013,425 barrels, making 60.23 per cent. of the entire output, against 38.48 per cent. produced by the Eastern fields. The figures for 1906 are not available, but careful estimates make the output of the Western fields between 68,000,000 and 69,000,000 barrels, and that of the Eastern fields (including Illinois) 53,000,000 barrels. In the matter of percentage of total production, therefore, the Western fields no doubt have further increased their lead over the Eastern States during the past year. Less than 1 per cent. of the total yield has been furnished each year by miscellaneous fields not included in either of the foregoing percentages.

The greatest increase in output noted in any of the various centers of production this past year has occurred in the mid-continent field, and particularly in the Indian Territory. In 1905 the amount of oil run from wells in the mid-continent field was 12,013,495 barrels. In 1906 the runs were nearly doubled, amounting to approximately 21,540,593 barrels, exclusive of oil tanked by producers. With facilities to handle the entire output, there is little doubt that the production would have been above 30,000,000 barrels. The Prairie Oil & Gas Co., Western branch of the Standard Oil Co., up to the present time has been the only heavy purchaser of mid-continent crude. This company took approximately 21,190,593 barrels of the 1906 output, placing about 9,400,000 barrels in steel storage on the field, delivering about 5,000,000 barrels to the Standard refineries at Neodesha, Kan., and Sugar Creek, Mo., and shipping the remainder through the trunk pipe lines, two in number, leading to the Standard's refineries at Whiting, Ind., and on the Atlantic coast, where the crude petroleum is manufactured into kerosene, gasoline, naphtha, benzine, lubricating oils and other products. In 1905 the Prairie Company stored 6,251,735 barrels of mid-continent crude. It now has in tanks on the field more than 22,500,000 barrels of oil, and is constantly enlarging its storage capacity by the construction of new tanks. Other companies and individual operators have about 1,300,000 barrels of crude in storage, making the total stocks of oil nearly 24,000,000 barrels.

Until July the price paid by the Prairie Company in 1906 for the best grade of mid-continent oil (32 gravity, Beaume, or better) was 52 cents, and for crude, which it classed as fuel oil (under 30 gravity, Beaume), 35 cents. During the latter half of the year the market has been 39 cents for the best grade and 26 cents for the grade classified as fuel oil. The value of the output, according to the market established by the Prairie Company, has been about $9,000,000.

The coming year will witness a change in conditions in the mid-continent field. The two Texas interests, which will lay eight-inch pipe lines from the Tulsa district, in Indian Territory, to the Gulf coast, will be purchasers of oil. At the outset they will erect 1,300,000 barrels of steel tankage, which will doubtless be added to as necessity requires. Pending the completion of the Gulf Company's pipe line the Gulf Refining Co. will ship 4000 to 5000 barrels a day in tank cars from the Glenn pool, south of Tulsa, to the Gulf refinery at Port Arthur, a distance of 580 miles. Both the Gulf Company and the Texas Company will be in the market for oil, and as the Prairie Company is increasing its facilities with a view to handling 75,000 barrels a day it probably will be only a question of months until there will be demands for 100,000 barrels a day. The present daily capacity of the mid-continent field is put at 130,000 to 140,000 barrels, of which about 67,000 barrels is being marketed. It is asserted, and with good grounds for belief, that the output of the field could be increased to 200,000 barrels a day.

The principal development in the mid-continent field during the past year has been in the Indian Territory, what is thought by many to be the most important pool yet discovered in that region having been opened up in the Creek Nation, 15 miles south of Tulsa, on the Glenn farm. The first well was drilled in a year ago last November, but development did not begin in earnest until the early fall of 1906. During the year about 4000 acres in the Glenn pool have been defined as producing territory, with a capacity in its present stage of development exceeding 55,000 barrels a day. Less than 100 wells have been completed in the district. The oil is of excellent quality, testing about 37 degrees Beaume, and contains percentages of naphthas and kerosene that make it especially desirable for refining. The pay sand is found at the 1500-foot level, and is unusually thick and rich, the wells flowing naturally from 40 to 90 barrels an hour when brought in.

It was the development of the Glenn pool that determined the building of pipe lines to the Gulf coast, although no one has doubted that such lines eventually would be constructed to provide an outlet for a portion or all of the surplus production in the mid-continent field, the surplus being the amount over and above the quantity taken by the Prairie Oil & Gas Co. Operators are expecting to see new pools opened up throughout the region south of Tulsa and north of the Gulf coast, an expanse of 500 miles from north to south in which indications of oil exist at hundreds of points. Already two pools, Corsicana and Powell, have been developed in this territory, their location being about midway between Tulsa and the Gulf coast. At other places petroleum has been developed in small quantities, giving promise, however, of a greater yield when the pay sands are located by the drill.

Production of the Gulf Coast Field, 1901 to 1906, Inclusive, in Barrels of 42 Gallons.

Year.	Spindletop.	Sour Lake.	Saratoga.	Batson.	Humble.	Jennings.	All other districts.	T'l Gulf Coast.
1901.....	3,593,113	.....	.....	.....	.....	.....	.....	3,593,113
1902.....	17,420,949	*44,838	.....	.....	.....	548,617	.....	18,014,404
1903.....	8,600,905	*8,848,159	.....	4,518	.....	892,609	25,192	18,371,383
1904.....	3,433,842	6,442,357	739,239	10,904,737	.....	2,923,066	188,028	24,631,269
1905.....	1,652,780	3,362,153	3,125,028	3,774,841	15,594,310	8,891,416	126,065	36,526,593
1906.....	1,034,700	2,376,000	2,546,000	2,673,000	3,523,900	7,540,900	350,000	20,044,500
Totals.	35,736,289	21,073,507	6,410,267	17,357,096	19,118,210	20,796,608	689,285	121,181,262

*Includes production of Saratoga.

Foregoing figures represent oil produced and sold. During the six years that the development of the Gulf coast field has been in progress fully 5,000,000 barrels of crude oil have been consumed in the various districts for fuel under boilers operating drilling rigs, pumping rigs, etc., making the total output 126,181,262 barrels.

Production of Central and Northern Texas districts (Corsicana, Powell, Henrietta), amounting to 6,025,057 barrels since 1895, not included in above table.

Production of the Gulf Coast Field in 1906 (Texas and Louisiana), Estimated, in Barrels of 42 Gallons.

Month.	Jennings.	Humble.	Batson.	Saratoga.	Sour Lake.	Spindletop.	Totals.
January.....	693,200	402,200	273,000	168,500	201,500	99,200	1,837,600
February.....	625,000	271,200	243,000	163,500	208,300	71,500	1,582,500
March.....	614,100	252,500	256,000	172,000	205,000	102,000	1,601,600
April.....	594,600	265,000	241,000	202,000	207,700	102,000	1,612,300
May.....	860,000	360,000	211,000	245,000	198,500	91,000	1,965,500
June.....	750,000	400,000	210,000	240,000	195,000	84,000	1,879,000
July.....	614,000	390,000	210,000	230,000	200,000	80,000	1,724,000
August.....	695,000	295,000	210,000	205,000	180,000	75,000	1,660,000
September.....	550,000	253,000	203,000	208,000	189,000	69,000	1,472,000
October.....	600,000	225,000	208,000	215,000	200,000	90,000	1,538,000
November.....	535,000	215,000	205,000	235,000	180,000	85,000	1,455,000
December.....	410,000	195,000	203,000	262,000	211,000	86,000	1,367,000
*Totals.....	7,540,900	3,523,900	2,673,000	2,546,000	2,376,000	1,034,700	19,694,500

*In addition to the foregoing there was a production estimated at 100,000 barrels from the Welsh, Anse la Butte and Caddo districts in Louisiana, and 250,000 barrels from the Hoskins Mound, Dayton and Matagorda districts in Southeast Texas, making the total output of heavy oil for the year 20,044,500 barrels. The production of the Corsicana, Powell, Henrietta and South Bosque fields, in Northern and Central Texas, is not considered as a part of the Gulf coast output. If amounted to about 900,000 barrels in 1906, bringing the total yield of petroleum in Texas and Louisiana during the year, in round figures, to 21,000,000 barrels.

Production and Value of Crude Petroleum in Texas and Louisiana to Date.

	Barrels.
Net quantity produced and sold from Gulf coast field, 1901 to 1906, inclusive.....	121,181,262
Net quantity produced and sold from other districts in Texas (Corsicana, Powell, Henrietta), 1896 to 1906, inclusive.....	6,025,057
Total net production, Texas and Louisiana.....	127,206,319
Net value of Texas and Louisiana crude petroleum at the wells.....	$48,794,752
Amount received by marketing companies for Texas and Louisiana crude petroleum, delivered on board cars at railroad shipping points, on board vessels at Port Arthur and Sabine, and at refineries (estimated).....	70,000,000

Shipment and Consumption of Gulf Coast Crude Petroleum in 1906 in Barrels of 42 Gallons.

Shipped by rail to fuel-oil consumers in Texas, Louisiana and other States (net)...	13,042,131
Shipped by pipe line and barge from Jennings to the Mississippi river at Plaquemine, largely for the fuel-oil trade, but a portion of it reshipped in tank steamers to Atlantic coast refineries.....	2,207,192
Shipped by vessel from Port Arthur and Sabine to fuel-oil consumers and to Atlantic coast refineries.....	6,057,987
Run by Southeast Texas refineries for the manufacture of gas oil, asphalt, lubricating oils, kerosene, gasoline and other petroleum products (estimated).....	8,000,000
*Total shipments and consumption of crude petroleum.....	29,307,310

*No account taken of field consumption.

Rail shipments in 1905 amounted to 14,539,828 barrels, indicating a decrease of 1,497,697 barrels in 1906 as compared with the previous year.

Port shipments in 1905 amounted to 6,595,706 barrels, indicating a decrease in 1906 of 537,719 barrels.

Shipments from Plaquemine in 1905 amounted to 1,203,848 barrels, indicating an increase in 1906 of 1,003,244 barrels.

Refinery consumption in Southeast Texas was estimated at 7,000,000 barrels in 1905, indicating an increase of 1,000,000 barrels in this item in 1906.

Total shipments and consumption (not including field consumption) in 1905 amounted to 22,339,382 barrels, indicating a decrease in 1906 of 32,072 barrels.

(December, 1906, shipments and consumption estimated.)

Total Shipments of All Grades of Gulf Coast Petroleum in 1905 and 1906.

(This statement includes everything but refined products shipped by tank car.)

	Crude by rail. Barrels.	Crude from ports. Barrels.	Refinery products. Barrels.	Total all grades. Barrels.	Estimated value.
1905.....	14,539,828	7,799,554	3,887,091	26,226,473	$15,935,907
1906.....	13,042,131	8,265,179	4,282,982	25,590,292	25,344,847

Shipments in 1906 compared with 1905 show a decrease of 1,497,697 barrels in rail movement of crude, an increase of 465,625 barrels in port movement of crude, an increase of 295,891 barrels in port movement of refinery products and a decrease of 636,181 in total movement of all grades.

Increase in estimated value of shipments in 1906 over 1905 $9,408,940.

(Shipments of refinery products in tank cars not included in above table.)

Port Shipments of Southeast Texas Refinery Products in 1905 and 1906.

(This table does not include shipments by tank car.)

	Barrels.	Estimated value.
Shipments of gas oil, asphalt, lubricating oil, kerosene, gasoline and other refinery products in 1906.....	4,282,982	$10,707,425
Shipments of same grades in 1905.....	3,887,091	7,774,182
Increase in 1906.....	395,891	$2,933,243

Above shipments were from refineries of the Gulf Refining Co., the Texas Company and the Security Oil Co., and were loaded at Port Arthur, Sabine and Port Neches, consigned to domestic and foreign ports.

(December, 1906, shipments estimated.)

Table Showing Average Daily Consumption of Gulf Coast Crude Petroleum in 1906 in Barrels of 42 Gallons.

	Daily average.
By fuel consumers, principally in Texas and Louisiana (rail shipments by tank car and barge shipments on Mississippi river).....	44,519
By Eastern refineries, gas works and fuel consumers at Atlantic coast points (vessel shipments from Port Arthur and Sabine).....	13,841
By Southeast Texas refineries (Gulf Refining Co., the Texas Company, Security Oil Co. and United Oil & Refining Co.).....	21,918
Total.....	80,278
Production of Gulf coast districts.....	54,916
*Shortage.....	25,362
	80,278

*Supplied by oil taken from stocks accumulated in previous years.

Production of the Mid-Continent Field (Kansas, Oklahoma and Indian Territory).

Comparative statement of pipe-line runs by Prairie Oil & Gas Co. in 1905 and 1906. These figures do not represent the full capacity of the field; they show the amount of oil actually run from the wells by the Prairie Company, which takes all but a very small percentage of the oil that is handled in the mid-continent field. It is generally believed that the output of the field could have been doubled in 1906 if there had been facilities to care for the oil.

	1905.		1906.	
Month.	Total barrels.	Daily average.	Total barrels.	Daily average.
January.....	793,648	25,601	1,472,214	47,491
February.....	564,432	20,158	1,352,531	48,305
March.....	695,908	22,449	1,693,182	54,619
April.....	549,339	18,311	1,779,251	59,308
May.....	784,229	25,298	1,741,941	56,192
June.....	715,397	23,847	1,658,433	56,281
July.....	1,090,999	35,194	2,022,215	65,233
August.....	1,212,912	39,126	1,779,262	57,395
September.....	1,203,362	40,112	1,546,719	51,557
October.....	1,380,208	44,523	2,099,650	64,827
November.....	1,355,012	45,167	1,945,195	64,840
December.....	1,509,325	48,914	*2,100,000	*67,742
Totals.....	11,854,822		21,190,593	

*December, 1906, runs estimated.

In addition to the foregoing there were shipments in 1905 (including miscellaneous refinery consumption) amounting to 158,673 barrels, making the total production accounted for 12,013,495 barrels. The shipments and runs in 1906, other than those of the Prairie Oil & Gas Co., are estimated at 350,000 barrels, making the 1906 production accounted for 21,540,593 barrels.

Table Illustrating How the Centers of Greatest Petroleum Production Shifted from the East to the West in the Six Years 1900 to 1905, Inclusive, in Barrels of 42 Gallons.

Eastern Fields:	1900.	1901.	1902.	1903.	1904.	1905.
Pennsylvania, New York, West Virginia and Ohio.....	36,295,433	33,618,171	32,018,787	31,558,248	31,409,567	29,366,960
Lima (O.), Indiana and Illinois.	21,758,960	21,933,629	23,358,826	24,080,264	24,689,184	22,475,255

Western Fields:						
Kansas, Indiana Territory and Oklahoma	81,186	189,151	368,849	1,071,125	5,617,527	12,013,425
Texas and Louisiana	836,039	4,393,658	18,632,275	18,873,343	25,200,371	37,046,605
California	4,324,484	8,786,330	13,984,268	24,382,472	29,649,434	33,427,473
Other fields	324,437	468,255	403,911	495,885	515,877	387,792
Totals	63,620,529	69,389,194	88,766,916	100,461,337	117,080,960	134,717,580

Shifting of the Centers of Greatest Petroleum Production from the East to the West Illustrated by Percentages of the Total Production in the Six Years 1900 to 1905, Inclusive.

Eastern Fields:	1900.	1901.	1902.	1903.	1904.	1905.
Pennsylvania, New York, West Virginia, Ohio, Indiana and Illinois	91.25	80.06	62.38	55.38	47.91	38.48
Western Fields:						
Kansas, Indian Territory, Oklahoma, Texas, Louisiana and California	8.24	19.26	37.16	44.03	51.65	60.23
Other fields	.51	.68	.46	.49	.44	.29
Totals	100.00	100.00	100.00	100.00	100.00	100.00

Beaumont, Texas.

STRIDES IN SOUTHERN COAL MINING.

By FREDERICK E. SAWARD.

[Written for the Manufacturers' Record.]

"Time rolls its ceaseless course," said the great poet. Another year has been recorded as of the past, and we gather up the statistics and endeavor therefrom to forecast the future. It is a task wherein many strands must be woven to make a complete whole, and the mind must be attuned to millions before the subject can be grasped in its entirety and magnitude. Those of us who have seen the growth marvel at it. Those who have just come on the scene of business activity will have greater cause to marvel when 10 years have passed away.

It has been my pleasant task to write of the coal trade of our country for several decades. I have seen it gradually but surely outstrip the tonnage of the mother country, until it has attained to a position that is ours beyond recall. The whole tale is as a fairy tale, that of our growth, and there is more of value each year now dug from our coal mines than from the diamond mines of Africa or from the gold mines of the world. Fancy, then, from this basis what is the future use and value of this fuel when applied to the arts, manufactures and sciences. The train that rushes from one end of this great country to the other—the Pennsylvania Limited or the Florida Special—would not be possible were it not for coal; the turning of 40,000,000 tons of iron ore into steel products, from battleship armor plate to watch springs, could not be accomplished. Our cotton, corn and copper could not be turned to advantage were it not for that other and greater "C"—coal.

Perhaps this is enough of rhapsody on general principles, and therefore let us get down to facts before we soar again; let us sing the song of the great coal district south of the old line. It is good blank verse, perhaps only prose, but surely nothing to weary the reader, who should be interested in the welfare of this country. It is something worth talking about when one can show that the present tonnage is over 80,000,000 tons a year, and this from a district or portion of the United States that was hardly known in the coal trade a few years ago. Take a general survey of the tonnage of the world, with its production of something like 1,000,000,000 net tons in the year, and then consider that the United States does four-tenths of this quantity, then that the Southern States do one-fifth of that, and the importance of the district is readily seen. This importance may be grasped when one learns by the facts which follow how recent has been the growth of this tonnage to its present proportions. I know very well that the total is not as large as that of the Keystone State in bituminous coal alone, but that State has figured in the coal-trade annals since 1840, and it took 50 years for it to reach the total now claimed for the Southern States.

I class so Southern, for coal-trade purposes, West Virginia, Alabama, Kentucky, Tennessee, Maryland, Virginia, Indian Territory, Arkansas, Texas, Georgia. Now, let us see what can be said of this part of the country. Nearly 70 per cent. of the area of West Virginia, or 17,280 out of a total of 24,780 square miles in the State, is included in the coal fields of the Appalachian system, which crosses the State from Pennsylvania and Maryland on the north to Virginia and Kentucky on the south. Only the area lying to the east of the escarpment of the Allegheny mountains is outside of the coal-bearing rocks. All of the coals of West Virginia belong to the bituminous or semi-bituminous varieties, but some cannel and a peculiar grade known as Kanawha splint are mined in the southern part of the State. One of the most important seams in the State is the celebrated Pittsburg bed of Pennsylvania, which extends over a considerable portion of West Virginia and Ohio.

The growth in output of West Virginia has been as below:

1880	1,800,000 tons.
1890	7,390,000 "
1905	37,800,000 "
1906	41,000,000 "

Alabama is the next in line in the South for production, and the coal fields of that State form the southwestern end of the great Appalachian coal field, which extends from Northern Pennsylvania to Central Alabama. The coal-bearing formations narrow in Tennessee, but widen abruptly in Northern Alabama, and cover about 6000 square miles in the northern half of the State. There are four distinct coal-producing basins or districts in the State—the Coosa, Cahaba and Warrior basins and the plateau regions. The first three mentioned areas derive their names from the rivers which drain them. The growth in tonnage in Alabama has been as below:

1880	325,000 tons.
1890	4,100,000 "
1905	11,860,000 "
1906	12,750,000 "

Kentucky is third in the list of the States under consideration, and the Geological Survey speaks of it thus: "Kentucky is the only one of the coal-producing States which has within its borders areas belonging to any two of the great coal fields. The eastern counties of the State are underlain by coal beds of the great Appalachian system, extending entirely across the State in a northeast-southwest direction, while the southern limits of the central or eastern interior field are found in the more northern counties of the western part of the State. The total area underlain by coal in the eastern counties of the State is estimated at 11,180 square miles. The coal-bearing areas in the western part of the State are estimated to contain 5800 square miles, or somewhat more than one-half of that of the eastern part of the State. Up to the close of 1905 the western district, however, produced considerably more than half the total output of the State, but the recent developments in Pike, Johnson and other counties of the eastern portion of Kentucky lead to the impression that the production in the eastern district will soon exceed that of the western."

The progress of production in Kentucky is reported as follows:

1880	946,000 tons.
1890	2,700,000 "
1905	8,400,000 "
1906	9,250,000 "

Tennessee falls next in line with its coal output. About 4400 square miles of the State are underlain by coal measures, and approximately half this area contains one or more beds of workable coal. The coal measures occupy a belt extending entirely across the State in a northeast-southwest direction. This belt has a width of 70 miles at the Kentucky line and is there practically continuous. At the Georgia-Alabama line its width is about 50 miles and only the highest land is occupied by coal measures, the valleys of the Tennessee river and its tributaries being cut in lower carboniferous formations. The greater part of the workable coal occurs in three basins, namely, the Wartburg, the Walden and the Sewanee. Output in Tennessee has progressed as below:

1880	500,000 tons.
1890	2,170,000 "
1905	5,960,000 "
1906	6,250,000 "

Maryland is the oldest of the coal-producing States grouped in this article, and its coal is known all over the country for its quality as a smithing coal. Its record begins with the year 1840, and yet, despite the growth of other States, this small coal field continues to hold its own in the matter of output in recent years. Thus:

1880	2,229,000 tons.
1890	3,357,000 "
1905	5,108,000 "
1906	5,350,000 "

Taking up next the Old Dominion State, we find it is now classed as one of the considerable coal-producing States, for the development in the southwestern counties since the opening of the Norfolk & Western Railway into that region has been on a rapid scale. The development there for local use is likely to grow apace. The record may be made up as follows:

1880	40,000 tons.
1890	784,000 "
1905	4,276,000 "
1906	4,700,000 "

Arkansas comes into line with a small tonnage, though it may be expected to grow as the railroad lines are extended therein. It was nothing in 1880, and footed up 2,000,000 tons in the past year.

Indian Territory coal has increased in production from 120,000 tons in 1880 to, say, 3,000,000 tons in 1906.

Texas had an output of 125,000 tons in 1884, and that of last year was probably 1,300,000 tons.

Georgia is put down for 154,000 tons in 1880, with an estimate of 400,000 tons in 1906.

All this shows how really new, as one might say, is this trade in the several districts, how little of the vast resources have as yet been touched, how much yet remains to be done. When this is seen and known, and when it is also known that the recent growth has been a good pace, particularly in Alabama and the Virginias, what may one not expect for the future? They tell us that the Mountain State is now second on the list of coal-producing States in the Union, having outrun Illinois, which so long held that position.

It means something in the industrial history of this country to know that its coal output has increased from 191,000,000 tons in 1896 to over 400,000,000 tons in 1906.

Readers of the MANUFACTURERS' RECORD are familiar with the fact that over three years ago, when the President had signed the Panama canal purchase bill, I had something to say in regard to the value of this waterway to the coal operators of the Southern States. The ideas then set forward have only been strengthened with the course of time. One can readily see that during its completion there will be a lot of supply coal wanted, and when the vessels of the world pass through it there will be a large tonnage required for bunker purposes, even as now Suez and Aden are coaling ports on that other great canal. Then the Pacific trade, American and Asiatic, ought to represent some millions of tons a year. A decade of years is not much in the history of a nation, and those of us who are here 20 years hence will view the records of our present small (?) tonnage much as one views the records of the discovery of a "cole mine" by Father Hennepin as an amusing historical fact.

According to official statistics, up to the close of the year 1865 the total consumption of coal in this country had amounted to 284,890,055 tons. In the following decade it increased to 419,425,104 tons, making the total production up to that time more than 700,000,000 tons. The grand total of coal produced in this country up to 1905 was 5,970,736,571 short tons. This great increase in the production of coal, when considered with the increase in the population, furnishes some interesting comparisons. Going back for a period of a little over 50 years, or to the middle of the last century, and comparing the statistics of coal production with the increased population, it is found that in 1850, according to the census of that year, the production of coal amounted to 6,445,681 tons when the population of the country was 23,191,876. The per capita production of coal in that year is thus seen to have been 0.278 tons. In 1860 the population was 31,443,321, and the coal production amounted to 14,333,922 tons, or an average of 0.514 per capita. The per capita production has jumped by leaps and bounds ahead of the increase in population. While the population from 1850 to 1900 showed an increase of 230 per cent., the production of coal increased 4084 per cent.

Taking the sum total of the coal production of the United States as 400,000,000 tons, can it be doubled in the 10 years forward as it has in the 10 years past? Why not? There are millions of acres of our land yet to be developed and filled with population. The "great American desert" is being pushed farther away and it is dwindling annually. More railroads are needed in many parts of the country, or will be, despite the pessimists. Railroads have developed wild areas into productive districts and added to the population by this development and enterprise. The truth of this is not far to seek in that portion of our country under discussion. It is enough to look forward 10 years in making estimates with the puny grasp by humanity of events, but one can hardly expect or look for another doubling up, for after a certain point has been reached the rate of progression is not so rapid.

As a recapitulation let us make this statement of the progress of mining—in thousands of net tons—in the States grouped in this review:

	1880.	1890.	1905.	1906.
West Virginia	1,800	7,390	37,800	41,000
Alabama	325	4,100	11,860	12,750
Kentucky	946	2,700	8,400	9,250
Tennessee	500	2,170	5,960	6,250
Maryland	2,229	3,257	5,108	5,350
Virginia	40	784	4,276	4,700
Arkansas	15	400	2,000	2,200
Texas	...	184	1,200	1,350
Georgia	154	228	351	400
Totals	6,009	21,213	76,955	83,250
Indian Territory	120	869	2,924	3,000

It will be seen from this statement that 25 years ago the tonnage was practically nil except for the Maryland tonnage, also the West Virginia, which in part was the Baltimore & Ohio, plus some river ton-

nage. In the following decade the result shows the effect of the railroad entrance into West Virginia, Alabama, Kentucky and Tennessee. The end of the next 15 years showed a growth of over 360 per cent., with all the States participating. The estimate for 1906 is surely none too great in view of all the circumstances and conditions. Is 120,000,000 tons too large a figure to set down for 1911?

The public is fickle and some legislators fancy they represent their constituents in a policy of annoyance, investigation and general "bucking" against the railroads, but what would have been conditions in the States named without the railroads that run into the defiles and cross the divides for the sake of coal? All honor to the rank and file and to the staff of those roads. They have fought a good fight and their reward will be a rich one as the years go by.

Is it any wild flight of the imagination to venture a few remarks or to estimate what will be the future of this portion of the country five years or ten years hence? Suppose the growth shall be at the same pace as within recent years; the total will run up to 120,000,000 tons in 1911 and 160,000,000 tons five years later. These are enormous figures to contemplate, and yet they are but keeping pace with recent growth, and unless some great national setback arises these figures may be equaled as the industries increase. It is a wide area, and as the development goes on there is much to be done in coal mining to satisfy this development. What are the railway lines doing to prepare for a growth of 100 per cent. in their coal traffic in 10 years? Ten per cent. a year each year for 10 years? Iron-making and kindred enterprises will no doubt grow in the Southland; railroad lines are being extended to the Gulf in several instances in order to meet the trade expected on the completion of the Panama canal, and all these will become users of coal.

A Year's Activity in Southern Railroad Building.

By S. G. WILMER.

[Written for the Manufacturers' Record.]

Railroad work in the South during the past year has been particularly active and interesting. More than 3000 miles were built, making the total mileage more than 64,000. Several important pieces of work which were under way for three or four years were finished and put in operation, other new construction was started, and great progress was made on various important enterprises. Considering the accomplishments of the year, it may be said that the railroad facilities of the South have experienced a material enlargement, but that they are yet far behind the requirements of commerce and industry in this section is shown by the pressing congestion existing upon many railroads, and which continues to hamper trade.

Looking over the field, State by State, it is found that Maryland contributed to the railroad work of the year the completion of the Cumberland extension of the Western Maryland, connecting up the Maryland line and the West Virginia trackage of the system, and it is all now in successful operation. The company has also double-tracked its line near Baltimore, and this sort of work will be further extended during 1907. It has also made surveys for an extension toward Pittsburg, but this construction has not yet been authorized. Another important piece of work in Maryland is the building of the Washington, Baltimore & Annapolis Electric Railway, a double-track fast line which is to connect Baltimore with the national capital and also with the capital of Maryland. The branch to Annapolis is already built as a steam road, which will be converted for the use of electric motive power, but the entire line to Washington is all new construction. About 15 miles of track have been laid on it, and it is expected to have all finished by July 1. A notable feature of this road is that it promises to afford a service fully equal to steam roads in point of speed and comfort.

Great progress has been made at Washington, D. C., on the new union terminal, which will be used by the Pennsylvania, the Baltimore & Ohio, the Southern Railway, the Seaboard Air Line, the Atlantic Coast Line and other railroads entering that city. The tunnel under Capitol Hill is finished, and the other line work is so well advanced that it is expected part of it will be put in use before long.

In Virginia an important electric railway is nearly completed. That is the Richmond & Chesapeake Bay Line from Richmond to Ashland, Va., a distance of 15 miles. More than half of the track has been laid, and equipment for the road is already being received. Within a few months it will be in operation, and then the further extension of the track will be taken up. But the greatest piece of railroad work in this State is the construction of the Tidewater Railway, which has been pursued with unabated wisdom and energy. More than a third of the track across Virginia has been laid, and all is to be finished by the end of 1907; work on the terminals at Norfolk is also in progress. Both the Chesapeake & Ohio and the Norfolk & Western Railway have continued judicious improvement of their properties, much double-tracking being built and several extensions. The second-track work on the Washington Southern and Richmond, Fredericksburg & Potomac railroads, together with the building of the great classification yard near Alexandria, is another important piece of work done during the past year. The Southern Railway continued its building of second track.

West Virginia saw the completion of the Coal & Coke Railway in 1906, and also much new construction on the Deepwater road, which is the West Virginia end of the Tidewater Railway. The building of new railroads and also the construction of branches from trunk lines for the development of coal and timber properties is frequent in this State, and considerable work of this character was done during the past year, while more is proposed for this.

North Carolina is conspicuous for the construction that has been done by the South & Western Railway in pushing its line southward through the Blue Ridge, and while the company has actually completed but little track, much grading has been finished through the most difficult parts of the mountains, and track will be laid on it this year. The consolidation of several railroads under the name of the Norfolk & Southern Railway Co. and the building of extensions thereto is another great piece of work for which this State is distinguished, while the Southern Railway is still pursuing active work in the western part of North Carolina looking to connect up a line between Bushnell, N. C., and Maryville, Tenn.

The starting of railroad construction on the Charleston & Summerville Electric Railway is about the only important piece of railroad work to be noted in South Carolina for 1906, but there are several ambitious projects in view for 1907, including the plans of the South Carolina Public Service Corporation, which aims to construct a system of electric railways, about 500 miles of track being already projected. The Seaboard Air Line also has some work mapped out.

Georgia contributes to the work of the year in a new project of considerable size. This is the merging of half a dozen small railroads under the name of the Georgia & Florida Railway, and they will be connected up during the coming year so as to make a through line from Augusta to Valdosta, Ga., and thence into Florida. The Atlanta, Birmingham & Atlantic Railway has made great advances with its new construction since this time a year ago, completing the road nearly to the western boundary of Georgia, and the Louisville & Nashville finished its Atlanta extension. Several new lines of importance are proposed, and here and there construction has started, but one of the most interesting is that to connect Atlanta, Griffin, Macon, Americus and Albany by means of electric railways. For this work organizations have been perfected and surveys made, and it is expected to start construction soon.

The Key West extension of the Florida East Coast Railway continues to be the most important piece of railroad construction in Florida. Much progress was made on grading and viaduct work during the year, most of the roadbed on several keys being prepared for the line and not a little of the bridge work being finished. Part of this extension at least will be completed in 1907, but it does not appear probable that operation will be undertaken until the track is laid all the way to Key West. On the west coast of Florida the building of the Tampa Northern is under way, and the extension of the Gainesville & Gulf toward Tampa is also started. Several other pieces of construction are begun and some of an important nature have been projected.

Alabama furnishes to the record of the year a continuation of work on the Atlanta, Birmingham & Atlantic extension, which is to be finished this year, and the beginning of construction on the Illinois Central extension to Birmingham, which is soon to be completed. Both the Southern Railway and the Louisville & Nashville have been, as usual, active in the construction of branches in the mineral district of Alabama, and they have also improved existing lines in various ways, including the building of second track. The Atlanta & St. Andrews Bay Railway has also built some line, likewise the Tombigbee Valley Railway.

The New Orleans Great Northern Railroad has made rapid strides with the building of its line in Mississippi, and it is now under contract as far as Jackson, while unconfirmed reports say that it will build from there northeasterly to Columbus, Miss., and north to Memphis, Tenn. The Mississippi Central is busy with completing a western extension to Natchez, and it also proposes to build southward from Hattiesburg, Miss., to the Gulf of Mexico. On this latter construction 10 miles of line are now built. The Gulf & Ship Island Railroad has completed its detour line; the Mobile, Jackson & Kansas City Railroad has been shaping up its track finished a year ago, and both the Southern Railway and the Yazoo & Mississippi Valley Railroad have built several extensions, while the Illinois Central is hard at work on its extension from Corinth, Miss., over into Alabama. The Edward Hines Lumber Co. of Chicago promises an important piece of work for 1907, this being the construction of a railroad from Gulfport, Miss., northwest to Poplarville, Miss. This may, it is said, be afterward extended to Natchez.

While Kentucky has not built much new mileage during 1906, the year has also been notable in that State for the development of several new projects, one of these proposing the construction of a new coal road from a connection with the Chesapeake & Ohio Railway, for a distance of 40 miles, into fields owned by the Northern Coal & Coke Co. The announcement that the Chesapeake & Ohio and the South & Western would be connected through the Breaks of the Big Sandy river is also a matter of moment. This will furnish a through line all the way from the Ohio river down through Kentucky, Virginia, Tennessee and North Carolina to a seaport on the Atlantic coast. The Madisonville, Hartford & Eastern Railway, a Louisville & Nashville proposition, was also started and is to be completed this year. The company will, moreover, build the Pine Mountain Railway from Williamsburg to Trace Branch, Ky. In the matter of electric railways, the Louisville & Eastern and the Lexington & Interurban Railways have been both doing construction with more in prospect, plans being entertained for a wider building of electric interurban railways in the thickly-settled parts of Kentucky.

Tennessee, like Kentucky, also gave but little new mileage to the year's record of railroad building, but several mineral projects are under way and are expected to display impressive results in 1907.

Louisiana did a great deal of work during the past 12 months. The Colorado Southern, New Orleans & Pacific Railway from DeQuincy to Baton Rouge is practically all graded and ready for the track, excepting for a large bridge, on which construction is under way. The Louisiana Railway & Navigation Co. has completed and partially put in operation its line to New Orleans, so that trains may now run through all the way from Shreveport. The Southern Pacific has done and is doing a lot of work in this State, and will complete its line from Lafayette to Baton Rouge this year. Several other extensions are also to be finished. The Rock Island is building south from Alexandria to Eunice, La.; the Opelousas, Gulf & Northeastern has built about 25 miles of its line, and will build more, while the Shreveport & Northeastern is also actively pushing construction. The New Orleans & Great Northern has also done some extension to Franklinton and will build more to Tylertown, Miss. A line between Mandeville and Abita Springs, La., is also proposed. An important electric-railway project is under way to build a line from New Orleans to Baton Rouge, and while it appears likely that it will be constructed, no actual work beyond surveys has yet been done.

In Texas the year has been a very busy one, about twice as much track having been built there as in any other Southern State. The most notable piece of work was the completion of the Trinity & Brazos Valley extension from Mexia to Houston, Texas, that is, so far as length of track is concerned, but the completion of the St. Louis, Brownsville & Mexico Railway from Bay City to Brownsville, Texas, with its branch to Sam Fordyce, was also an important step in the extension of Texas railways. The Houston & Texas Central road accomplished an important bit of construction by building a cutoff nearly 100 miles long, which will greatly facilitate its operation. The work of the Wichita Valley, the Wichita Falls & Oklahoma and the Abilene & Northern railroads, which together built a total of about 125 miles of new line, is also impressive in itself, besides being an indication of what may be expected in

the near future in the line of railroad development in this State. The Santa Fe has also done some valuable work in Texas, principally by building the Pecos & Northern Texas road from Canyon City to Plainview, 57 miles, and it has, moreover, done needed construction in other parts of the State. The Southern Pacific finished its line from Stockdale to Cuero, and the Beaumont, Sour Lake & Western did considerable construction on its line between Sour Lake and Houston, which is to be finished up this year. The Kansas City, Mexico & Orient Railway did not complete much mileage in Texas, but has done a good deal of grading (about 200 miles), on which track will be laid in 1907. The Texas Central also built its promised extension from Stamford to Rotan, and two big electric-railway projects, one from Dallas to Sherman, Texas, 60 miles, on which construction has begun, and another by the same parties from Dallas to Waxahachie, Ennis and Corsicana, 65 miles, are under way. The outlook for 1907 indicates that a heavy amount of mileage will be constructed.

Neither Arkansas or Missouri gave much new mileage to the record of 1906, but in the first-named State the Rock Island has completed its Southern extension, and in the latter the Missouri Pacific has finished up some needed bits of work, including the building of the Springfield Southwestern Railway. It should also be noted that this company did, in Arkansas, its promised work on the Gurdon & Fort Smith Railroad between Antoine and Caddo Gap, with more in prospect this year.

Oklahoma and Indian Territory also report small amounts of new railroad, but there is much projected, and the end of another twelvemonth may be expected to witness some important additions therein.

All the leading railroad companies in the South have also spent much money during the past year on betterments to line and terminals, including additional buildings and enlargement of old structures, besides making heavy purchases of equipment. Some of this work was of considerable magnitude and more is proposed. Practically every large or important point has seen some of this improvement done, and preparations are either made or about to be made to continue the policy of upbuilding uninterruptedly. The demand for coal and for coal land develment is also inspiring the building of many new branch lines.

MANUFACTURES AND MINING IN OKLAHOMA.

[Special Correspondence Manufacturers' Record.]

Oklahoma City, Okla., December 29.

According to Charles N. Gould, professor of geology at the Oklahoma State University, and a member of the United States Geological Survey, Oklahoma has "more kinds of minerals and more minerals of a kind than any of the other States," and in view of personal observation and investigations the writer is inclined to agree with the professor. She has coal, asphalt, gypsum, salt, stone of all varieties, clay of all kinds and sand adapted for all purposes—all these practically in inexhaustible quantities—besides lead, zinc and iron in possibly paying deposits, while sporadic samples of copper, gold and silver have been discovered. In addition she is also rich in oil and gas. The coal deposits are almost wholly confined to the Indian Territory, there being from 12 to 15 workable veins six to eight feet thick, some of them 200 miles in length. The great body of coal is found in the Choctaw country, though some heavy deposits lie in the Creek and Cherokee Nations. All of these lands are segregated, and no coal is mined at present save from leased premises. The chief development is at McAlester, from which the supply for the State is mainly drawn. Considerable surface coal is, however, being gathered in other sections of the State, and developments will undoubtedly result in the establishment of several great coal centers. Not much development, however, can be hoped for until after the lands are released from Indian domination.

Rock asphalt abounds in the Chickasaw country, particularly in the region of the Arbuckle mountains. The veins of this material, hundreds of which have been discovered, vary from 50 to 100 feet in width, are miles in length and possibly thousands of feet deep. The developments are very slight, and as yet experiment has not decided how it can be best utilized. It is safe to say the supply is inexhaustible, and that in time science will possibly reduce it to a basis where it can be handled with as much facility as is the Trinidad article. Ardmore is the principal seat of the asphalt industry at present.

In the matter of gypsum Oklahoma proper, considering the area covered, is the richest section of the world. The writer in a recent tour of the State looked upon visible deposits that would seem to be inexhaustible, and taking the figures of Geologist Gould as a basis, he would say there are 123,000,000,000 tons of this material within 100 feet of the surface, divided in greater or less amounts between the following Oklahoma proper counties: Canadian, Kingfisher, Blaine, Woods, Woodward, Comanche, Washita, Caddo, Custer, Dewey, Day, Roger Mills and Greer. The development of the gypsum industry in Oklahoma covers only five years, and yet it has assumed very formidable proportions. There are now five mills in operation, one in Roman Nose Cannon, one at Ferguson, one at Southard, two at Watonga and one at Alva, the combined output of all being 1050 tons per day. The average price of the finished product at the mill is $4.50 per ton, and a ready demand is had for all that can be produced, the only handicap upon the industry being the lack of cars. The market is mainly west of the Mississippi river, though in 1906 much of the stuff was shipped to points as far east as Columbus, Ohio. The manufacture of finished gyp requires careful though no scientific treatment, and the uses to which it is put are already numerous, and yet experiments are rapidly uncovering additional purposes to which it can be adapted. From gypsum is now produced plaster, concrete, tiles, railroad ties, abutments, artificial stone, foundations, stucco decorations, etc., and the very latest purpose to which it has been adapted is the manufacture of plaster boards, which are produced from a mixture of sand, gypsum and blue-stem grass. A company of St. Joseph (Mo.) capitalists has been recently formed, with ample capital to establish a manufactory at Alva, Okla., for the turning out of these boards. The boards are flexible, made of any desired length or width, and it has been demonstrated that they will take and hold nails as firmly as any class of lumber. The writer also inspected at Alva a building block made from one part gyp and three parts sand that developed greater tensile strength than a similar block made of the same proportions of Portland cement and sand. He also examined bricks made from 25 per cent. gyp and 75 per cent. sand, subjected to hydraulic pressure, that seemed to show durability far beyond those made from clay. The gyp industry is in its infancy, perhaps not yet carrying an investment beyond $250,000. It is safe to predict that within a decade the gyp industry of Oklahoma will assume enormous proportions, and that through its numerous adaptations it will revolutionize many industries that are now based upon metals.

In salt the new State has seven plains, or marshes, with an inexhaustible supply of water, two buckets of which, it has been demonstrated by careful and extended tests, will produce one bucket of salt. She has also in the Wichita mountains a very extensive deposit of rock salt. The salt industry is wholly undeveloped, and sooner or later a rich field must materialize in that line.

In the matter of stone the new State is particularly blessed. All kinds abound. In the Wichita mountains are found granite, marble and limestone, while sandstone of good quality is universal throughout the State.

Fine deposits of clay adapted to brick and tile making are found in every county, while fire-clay has been uncovered in the Cherokee, Creek and Choctaw countries in sufficient quantities to justify manufacture on an extensive scale. Potter's clay also in workable quantities is found in the Wichita mountains, as also a rich article adapted to medical purposes.

Sand of all grades and degrees of fineness is found in all portions of the State, and in some sections an article peculiarly adapted to the production of the finer lines of glass has been uncovered. Sooner or later the glass industry will probably become an important factor in the upbuilding of the new State.

With reference to iron, it is a mooted question as to whether the State has the ore in sufficient quantities to justify operation. The Arbuckle and Washita mountains show up with good prospects, but the ore seems to be only in pockets and scattered. What has been found and tested is of rich quality, and while the State's possibilities in iron are in doubt, the chances are that ore will be uncovered in sufficient quantities to justify heavy operations.

In the Wichita mountains sporadic samples of good promise of copper, silver and gold have been picked up from the surface. Geologists, however, appear to agree that no extensive deposits of the richer metals exist in any of the Oklahoma mountain ranges, but from what the writer has seen in the Wichita mountains he is inclined to the belief that when all restrictions are removed from the mineral privileges of this beautiful range of mountains the ubiquitous prospector will uncover deposits of copper, silver and gold as rich as any that have been turned up in California, Colorado, Nevada or Alaska, together with coal in unlimited quantities.

It is agreed among the geologists that lead and zinc abound in the northeast corner of the Indian Territory, in the vicinity of Afton and Miami, and it only needs capital for development purposes to very quickly render the lead and zinc industry a prime factor in enhancing the prosperity of the new State. These lands are, however, as are all other mineral lands, segregated, and capital naturally hesitates to make investments upon leased lands. The sooner Congress takes some action to relieve these lands so as to allow them to pass into the hands of individuals able and willing to develop them the better it will be not only for Oklahoma, but the country at large. It is right and just to protect the Indian, but it would seem there should be a way of looking after his interest without retarding the progress of the whole State, or, for that matter, of the whole nation.

Touching Portland cement, there are no mills for its manufacture in Oklahoma, but the plentiful supply of material out of which the same is made would seem to justify an adventure into that field. It is true the material is considerably scattered, but possibly no more so than it is in the other States. The writer would not be surprised, however, from his personal observation, if within a very few years a cement shall be produced from a mixture of gypsum and other ingredients superior in every respect to the article known as Portland. In the matter of mineral waters, Claremore and Sulphur Springs present possibilities that will attract capital and possibly develop these places into national health resorts.

In the matter of manufactures, the Oklahoma page upon which this record is to be written is practically blank. Many minor industries have been inaugurated, but nothing looking to the establishment of any standard enterprises or the investment of heavy amounts of capital have yet even been casually considered, save in the enterprise of the manufacture of gypsum. Nearly every city of any importance has its canning establishment, and a number of creameries are in existence, while several cities have planing mills and other minor factories, all of which have profitable records. In all industries so far established the progress has been rapid and the returns satisfactory. The gypsum industry shows the heaviest investments, the same being possibly from one-fourth to one-half million dollars. Bricks are extensively manufactured throughout the State, of the very best qualities, while grist mills and elevators are numerous.

Nearly every station in the cotton belt has its own gin, and in many instances a compress. Outside of the bailiwick of McAlester no coal is really mined, but at several points, namely, Broken Arrow, Bartlesville, Tulsa, Muskogee, Atoka, Coalgate, Red Fork, Dawson, Katoosa, Claremore, Henrietta, Baker, Alderson, Hartshorn, Haleyville, Wilburton, Howe, Krebs, Haley Ola, Dugan, Cherryvale, Edwards, Cameron, Koshee, Lehigh, Prior Creek, Midway, Caney Creek, Oleah and Collinsville much surface coal, that is, scrapings, is being gathered, sufficient to supply the demand of the immediate neighborhood and also affording shipments to other points. At or near each of these places supposedly inexhaustible deposits of coal exist that only await favorable opportunity for development. It is generally admitted that the coal of the Indian Territory is the richest in bitumen of any, at least in the United States. The new State royally abounds in all classes of raw material for manufacturing purposes save timber, and in that she has enough to supply domestic demands in all the rougher lines, and the rapidity and facility with which timber has been grown is a guarantee that the timber industry can be made very profitable. There would seem to be no reason why at a very early date Oklahoma shall not take high rank among the manufacturing Commonwealths.

In all lines of general business the progress of the new State during the past year has been phenomenal, towns having sprung into cities—from mere retail stations into notable wholesale and jobbing centers, while hamlets have developed into villages and villages into important towns.

The railway systems of the State are widely ramified and most excellently operated, but for the past several weeks all of them have been sadly handicapped by rainy weather; during the past month, at least, such a thing as a train on time has not been known. Two new roads are now in contemplation—one, the Indian Central, a Missouri Pacific connection running from Claremore to Paris, Texas, and the

other, having its inception in Kansas City, running through Lawton and on down to El Paso, with its final terminus at San Diego, Cal. Both of these roads may be said to be practically under construction.

Really there is no gauge by which to measure the growth of the new State, for the very simple reason that immigration during the past year has been abnormal, while the season has been wholly exceptional. The influx of capital, too, for investments in real estate has been heavy almost beyond belief. No authentic reports of the current year are accessible, therefore all that might be said would be in the nature of guesswork. The writer, however, during a tour of pretty much the whole State, extending over several months, has seen enough to convince him that the progress during the past year has been without precedent, and that permanent prosperity abides within the new Commonwealth.

In agriculture Oklahoma ranks even now well up to the front, and within a decade, if her development keeps pace with what it has been during the past four years, she will be pre-eminently "it." She has, perhaps, a greater variety of soil than any other State of the Union, and her farmers have had the advantage of the teachings of Uncle Sam's experimental stations, with the result that her crops are widely diversified through adaptation to different soils. Within her borders are grown practically every variety of vegetation that can be found within the limits of the Union, and in the matter of fruits, grapes and nuts her possibilities would seem to be without limit. It remains yet to be seen whether her soils possess the strength and durability of those of the great agricultural States of Illinois, Missouri, Kansas, Iowa, Nebraska, Wisconsin and Minnesota.

The writer has no reliable data at hand touching either the aggregate bank capital of the new State or the deposits, save from Oklahoma City. That city had, under her last financial statement, a combined bank capital of $775,000, with aggregate deposits, in round numbers, of $5,500,000. The last year shows no increase of capital, but an increase of clearances of a clean-cut $1,000,000. This is certainly indubitable evidence of business progress. The same ratio of capital, deposits and increase of clearances distributed among the cities of the State in proportion to their importance would certainly place the new State upon a solid financial basis.

In the matter of manufactures the adventurer has several locations from which to choose, either one of which, it occurs to the writer, cannot fail of giving satisfaction. Oklahoma City is the chief and central point of the new State, and possibly offers the best opportunities, but there are several aspirants, each one of which is putting forth superhuman efforts to take the lead. Among these are Shawnee, Alva, Guthrie, Tulsa, Bartlesville, Broken Arrow, Muskogee, Enid, McAlester, Watonga, Chickasha and possibly two or three other places. All of these locations are offering special inducements, and no manufacturer wishing to locate can go very far astray in selecting either one of them.

Finally, Oklahoma presents a virgin field for the investment of capital, with almost a certain prospect of success to enterprises in all lines controlled by competent and far-seeing business men, but the individual who comes here must not expect to meet tender feet, for it can certainly be figured that only the keenest, the most far-seeing and competent set of business men will be found here.

F. M. P.

IRON AND STEEL OUTLOOK IN THE SOUTH.

By JAMES A. GREEN of Matthew Addy & Co., Cincinnati.

[Written for the Manufacturers' Record.]

There is no more impressive spectacle in the industrial development of this country than the marvelous present expansion of the South. So rapidly has the South grown that today it has practically outstripped its railroad facilities, and while the Southern railroads are well managed, yet the greater part of the time they are unable to meet the demands made upon them, and car shortages and congestions of traffic are not occasional incidents, but are the regular things. They come about solely and simply because the railroads are being compelled to do more than is possible for them to do with their equipment. The crying need of the South today is better railroad facilities. This means that there are not enough railroads, and the existing railroads are single-tracked, and double tracks are absolutely necessary. The Birmingham district is a region where enormous traffic originates. It also is peculiar in having an extraordinary amount of local traffic, as ore, lime rock, coal and coke from the surrounding territory, say a district of from 40 to 50 miles, are poured into Birmingham for use of the furnaces there.

There has been considerable railroad building into the iron and coal districts of the South during the past few years, as is apparent in the development of the Illinois Central, the Tennessee Central, the Seaboard Air Line from Atlanta to Birmingham, the expansion of the Louisville & Nashville in the Eastern Kentucky and Tennessee and Wise county, Virginia, coal fields, and its direct line from Cincinnati to Atlanta via Knoxville, and in the various additions to the Southern Railway. But the great trunk lines that carry the constantly-increasing traffic of the South to the North and East are still slender, single tracks. The single line of rails belongs to the development period of a country; it belongs to the beginning of things, and the South has long passed that stage. The South is frequently spoken of as "the great undeveloped portion of our country." This is true in that its potential resources have not yet been developed to their full extent—as a matter of fact only a beginning has been made—but the South has come to the time when lack of railroad facilities is being seriously felt, and when it is evident that many of the present railroads are being taxed to their full extent, and if further progress is to be made better and more extensive shipping capacity is necessary.

For many years the South was, comparatively speaking, left to its own resources. This was probably partly due to the great mistakes made in the boom years in the late eighties and early nineties. There were in those boom days many commendable enterprises. There were also a great many schemes which were based on false pretences, or on insufficient knowledge, like the famous Fort Payne enterprise, which resulted in heavy loss to the stockholders, and usually in decided profit to the promoters. It has taken years of slow but steady achievement to dissipate the bad taste left in the mouths of the public by this kind of thing. It is very evident now that the South is not on a boom basis. The "hot air," to use the modern slang, or to use the time-honored English, the "glittering generalities" of the promoter, are not necessary in the face of actual accomplishment. The South has not gone back agriculturally. It is greater agriculturally than it ever was before, but it has also in addition become great industrially.

There used to be a joke which the society amateurs in the minstrel shows in Birmingham perpetrated regularly with immense applause. It ran something like this:

"Mr. Johnson, this Southern country is great. You can grow every kind of useful plants here that grow in the world."

"Yes, sir; this is a great country. You can grow every kind of useful plant that grows anywhere in the world."

"Then, Mr. Johnson, why can't we raise a steel plant in Birmingham?" And Mr. Johnson used to be meditatively silent.

But the successful building of the steel plant at Ensley by the Tennessee Coal, Iron & Railroad Co. stopped that joke, and it really marked the beginning of the new era. That steel plant is a demonstrated success. It has been enlarged, and a splendid rail mill has been added to it. And so genuine has been its success that the new management of the now virtually amalgamated Tennessee and Republic companies are about to very materially increase their steel production. Their steel mill has been continuously sold ahead for from 6 to 12 months, and if they had had the material they could have sold twice the tonnage. The wire mill, under independent auspices, that was started at the time the steel mill began operations, has grown and grown until it is now the Southern Steel Co., founded this year, with four blast furnaces, an open-hearth steel plant and mill and ample coal and ore properties to make its future supply of raw materials safe beyond question. This corporation is a natural development, a perfect exemplification of industrial evolution. First there was just a wire mill depending on another mill for its steel. The latter had so much business of its own that the needs of the wire mill could not always be met promptly. So the wire mill people saw that to be safe they must have their own open-hearth furnaces and make their own steel. This meant a billet mill, too. And to make sure of a supply of pig-iron for the furnaces a blast furnace was necessary. And so the Alabama Steel & Wire Co. built its splendid stack at Gadsden. Then, so as not to be dependent on others for ore and coke, mineral properties and coal mines were acquired. The plant grew and grew until it was evident that the Gadsden furnace would not be able to supply enough pig-iron, and so the Trussville, Rising Fawn and Chattanooga stacks, with all that goes with them, were added. This puts under one management a magnificent property.

It seems very likely that another entirely new steel mill will be built in the Birmingham district shortly. Two large companies are having plans drawn to this end, and it is almost certain that one or the other of these projects will become an accomplished fact. This development, present and prospective, of steel-making is the greatest new fact in the South. This means that the South, instead of merely producing pig-iron, is carrying out the iron trade to its logical conclusion, and is putting iron in finished materials.

In this connection it is well to mention that the South now is a vastly larger customer for its pig-iron than used to be the case. There was a time when practically 100 per cent. of all the Southern pig-iron had to come north of the Ohio and Potomac rivers to find a market. Now so great is the growth of foundries, machine shops and manufacturing establishments of one kind and another that probably less than 60 per cent. of Southern iron is shipped away from home. The balance finds a local market. And with the growing quantities of iron which are to be used in making steel the percentage of iron used at home will constantly grow greater. Unless there is a great increase in the building of Southern furnaces the South will gradually grow less a factor in merchant iron. This does not mean that ultimately all the iron made in the South will be used in the South, for that district will always be our influence in the general markets of the country, but it does mean that the South has found a large market near at hand, and the position of all the iron-making companies in the South has been immeasurably improved in consequence. The South will never again have quite the same keen competition to face as in the years when the local market was too small to be mentioned seriously, and the furnaces not running on steel irons have been vastly benefited by the taking of such a heavy tonnage of iron to go into steel, as it reduces the quantity for the general market just that much. In other words, the merchant furnaces of the South have a greater demand with less available supply.

There has been nothing spectacular in the recent growth of the iron trade in the South, for it has been normal and natural. The only thing that has been spectacular has been the market, and the soaring flight of iron prices this year has been a spectacle for gods and men. There has been nothing slow and gradual in that direction. But otherwise the improvement has been little by little, here and there, as, for example, the extensions of the Tennessee Coal, Iron & Railroad Co. and its building the famous new stack at Ensley, which has recently shattered all Southern records. The Sloss properties have been put in better and more effective shape than ever before. The old wreck of the Chattanooga furnace has been replaced by the Lacey-Buek Company with a thoroughly modern stack that has been a success from the day it started. The Roane Iron Co., under the leadership of the noblest Roman of them all, Capt. H. S. Chamberlain, the Nestor of all the Southern captains of industry, has built a new furnace and greatly extended its ore holdings. Even the furnaces in the Sheffield district, which once seemed to have a permanent black eye, have under the Sloss and the new Sheffield companies been put in good shape. The newest of all the large companies, the Alabama Consolidated Coal & Iron Co., has been blowing no bugles, but has been "getting there just the same." It has two excellent stacks at Ironaton, and has finished a large new modern stack at Gadsden, and has a second stack there nearing completion. This will give the Alabama Consolidated Company four stacks, and these are re-enforced by a tremendous acreage of brown and red ore lands, by coal properties and coke ovens. This company, like its main competitors, has ore and coal enough to outlast not only this generation, but the next century or more.

If the entire roll of the Southern furnace companies were called it would be found that all of them in the past few years had been put in better condition.

There has been this year a significant awakening o the real value of the ore and coal lands in the South. Their true worth has been realized, and the far-sighted enthusiasts who years ago saw that the strategic advantage of the future lay in the possession of raw materials have reaped the reward of their sagacity. Ore and coal lands have been in active demand, and at prices which are still insignificant as compared to Lake Superior and Connellsville values, but are excellent as compared with previous Southern standards.

A volume might be written on the development of the coal industry south of the river in the last few years. The West

Virginia coal fields are wonders. In Wise county, Virginia, the Stonega, Blackwood, Dorchester and Colonial operations have attracted attention everywhere. In Kentucky little has been done, but that little shows what there remains for the future. To tell the truth, the coal lands in Kentucky have as yet scarcely been touched. There are hundreds of thousands of acres of coal lands in that State which await the coming of railroads to make them available. Kentucky is full of coal, and while its position in the trade is at the present time of minor importance, some day the State will come to its own, and Kentucky coal will be more famous by far than bluegrass trotters and Bourbon whiskey. Tennessee has done marvelously well in its coal development, and in the next few years its production bids fair to be trebled. Of course, Alabama is far and away the leader in this direction in the South, and there is no danger of its pre-eminent position being questioned. This is not the place to go into what the completion of the Isthmian canal will do for the South, but that it will add a distinct value to Southern coal fields is a matter beyond question. The plain truth of the matter is that the South is beginning to be taken at its real worth. It is no longer lagging behind in the march of progress, but is in the great American procession moving forward to a manifest destiny in keeping with its own greatness and the greatness of the country.

ON THE SOUTH AS A PLACE TO LIVE IN.

By I. S. FIELD.

[Written for the Manufacturers' Record.]

There are scores of cities in which life is delightful for the man of independent means, but in which the man who has to make his way will find it difficult to go forward. There are scores of cities in which, by applying himself to the grind, a man may make money, but wherein the current of life runs shallow and existence holds little more than the opportunity to make money. It would be an easy task to name communities of either class, but the South belongs to neither. It is a good place to live in and the chance for making and enjoying money is there; at the same time it is a good place for making a living and for enjoying life. There is no other section in the whole broad stretch of our country wherein the man who makes a moderate living can get more out of life than he can in the South. It is a section neither of the poor nor of the rich. It has a multitude of well-to-do, self-respecting people who believe in living while they make a living and let others live who work while they work and play while they play. And it should not be forgotten that that is no mean consideration for any man who wants to locate where he can make a living for himself and family and get something more than mere meat and bread out of existence. There is no other section that offers finer business opportunities to any man, whether laborer or capitalist. And there is probably none that offers him the same opportunity to enjoy life to so full an extent upon a moderate income. Some of the resorts and the resort service in many of the cities are unequaled anywhere, population considered, and the heat of the most torrid days of summer can be escaped for 10 cents. The residents do not have to swelter on the front porch when the day's work is done. For these resorts are within easy reach and beckon him to cooling breezes. When all is said, is it not just as important that a town should be a good place to live in as it should be a good place to make a living in?

To come down to the material things of life, and whatever we may say we cannot get away from the material things of life, many of these Southern cities are particularly fortunate as regards markets. Things that are delicacies elsewhere are commonplace here, and the worries of the housewife on this score are confined largely to a choice between the good things within reach of the purse. The things of field and flood, of sea and air, are to be had at all seasons, and at reasonable prices. This may not be a poetical view, but it is eminently a practical view, and the meaning of it is that $2 will command in some places about the same comforts that $3 will in average cities in other sections. At the same time it is no exaggeration to say that there is also the opportunity to make $3 where there is the opportunity to make $2 in average cities. In the matter of resorts and suburban railway service, it may not be amiss to say that great and wonderful developments have taken place. Residents of many cities who want to go out for the evening can visit without inconvenience many pleasure resorts. It is not necessary to enlarge upon what this means to the man who wants to put away the cares of the day and return to the work of the morrow refreshed and invigorated. These things go to make the South one of the most delightful places to live in, leaving their mark upon the people in that tolerance of view and catholicity of judgment that makes them charming companions and good neighbors. This condition lends a peculiar and compelling charm that grows with increasing familiarity with it.

Many of the cities in the South are natural gateways for the commerce of the country's richest section. They occupy a unique position. They have a fine back county, and such is the nature of this supporting territory and such the diversity of its industries and interests that virtually they have no dull season. There is not a season of brisk business while one crop is being marketed, followed by a long period of stagnation. On the contrary, from year's end to year's end there is something to bring business to their markets and stores, money to their banks and life and bustle to their streets. It is not necessary to point out to business men that business risks must necessarily be less in a city where the current of commerce flows uniformly practically the whole year through than in a city where there is a period of flood and a period of subsidence. All things considered, this is perhaps one of the strongest appeals that the South makes to the calm judgment of the business man, for it means that he can do as much business annually on $60,000 capital as he could do elsewhere on a capital of $100,000, and is less liable to be caught in a sudden squeeze.

The South is largely a young man's mecca. It is really only beginning to find itself, and necessarily a region of that sort offers to the young man exceptional opportunities. He can grow with the city's growth and advance with the city's advancement. The gates stand wide open for him. Every day new opportunities arise, new needs of the community clamor to be supplied. As a consequence there is no part of the North, East or West wherein young men are winning to the fore more rapidly than the South, and none offers to the young man of character, brains and energy more splendid opportunities. In the city of today growth and development are absolutely dependent upon transportation facilities. Many of the important cities of the South have, in addition to railway facilities, steamship lines with passenger and freight service, and these lines connect with trunk-line railways making connection with all important seaports. The most striking phase of development is probably the growth of the suburbs and the extension of electric lines, which afford quick and easy access to the heart of the city for suburban residents. While it is true that whole blocks in the business section of the cities have been transformed in the last four or five years, the growth in the residential suburbs consequent upon the construction of electric lines has been even more striking. Within the past few years horse and mule car lines have been transformed into modern electric lines, which have brought rich and populous sections into immediate touch with the city, and have created for men of moderate means thousands of available home sites upon which handsome residences are going up. At the same time it has made it possible for citizens to live with economy and comfort and also for the business man to live where he chooses to live and be at his desk in 20 or 30 minutes after he leaves his doorstep. With these conveniences it is possible to combine the delights of country life with the conveniences of city life upon a basis of surprising economy. In the matter of schools, hotels, hospitals and the other usual concomitants of urban development, Southern cities are forging ahead of some of the larger cities in other parts of the country. Ahead even of its rapid material growth these things have come naturally in the South in some cases, until the citizen finds whatever advantages the modern city has to offer.

This is a story of the South, the promise and spirit of which far outrun the achievement that already speaks for itself. The greatest asset of the citizens of the South is their spirit, the abiding faith in the future and the intelligent realization of the fact that opportunity waits upon effort. Nowhere in this country of ours can be found as rich opportunities as in the South. The stores, wholesale and retail, are up to the standard, and their trade is large, lucrative and growing. At the same time the business opportunities in a mercantile way are by no means exhausted. The development of the manufacturing industries is also very striking. Many of the largest and representative foundries, machine shops and diversified industries have enlarged year by year until today they are occupying sites four and five times larger than when they started in business. There is still more room, and the opportunities seem more inviting than ever. The retrospect of the South for the last three decades shows that in a general way it has been a period of recuperation. That the immediate and consuming desire of her people has been recovery from the ravages of war was natural, and, indeed, inevitable, were they ever to attain the full measure of their possibilities. That within the succeeding 45 years the States below the Ohio should contain greater wealth and attain to a more commanding commercial and industrial rank than ever in their history is a surpassing tribute to the reserve powers of their population and to the splendor of their natural resources. The period of repair and renovation is now over. As the Southern States swept into the twentieth century the sceptre of poverty had passed from their midst. The scars of reconstruction are scarcely visible. Marvelous revelations of coming grandeur are unfolding and their tasks deal now not with the past, but with the present and the future. While the South had been repairing its house after the passage of the damaging storm, other sections of the country had been enlarging their uninjured domain. It may indeed be true that their coffers are full to overflowing, but it is none the less certain that the marks of disaster have passed away from the former and that inexhaustible material for the creation of a fabric of surpassing beauty and strength, the depository of priceless wealth, the ready tribute of nature to the hands of willing industry, has been discovered within its doors.

A YEAR'S PROGRESS IN SOUTHERN TEXTILES

By HERBERT C. CALDWELL.

[Written for the Manufacturers' Record.]

During 1906 announcements were made of the addition of 794,034 spindles and 9871 looms to the textile equipment of the Southern States, representing an investment of nearly $20,000,000. Indications for the future of this important industry are for a continuance of and an increase in the activity that has been displayed for some years in building new mills and adding to the equipment of established enterprises.

An emphatic trend of the industry in its steady growth is seen in two notable directions. These are the introduction of finer grades of cloth and yarn, and that the men most capable, from actual experience of years, of realizing the possibilities of the cotton-growing section for the cotton-manufacturing industry continue to be leaders in building new mills and enlarging old ones. This is one of the strongest indications that the South will eventually be the world's center of cotton manufacture. Glances through the textile news published by the MANUFACTURERS' RECORD from week to week during the year show that it is the additions to established mills which predominate in number of spindles over the strictly new plants. Yet many of the new companies are under the direct management of or have large interests taken in them by men connected with the management or ownership of established and successful Southern cotton mills. Another notable fact is that for many of the new mills and the additions to established plants Southern architects and mill engineers are in charge of plans, specifications, construction work and installation of machinery. The table of figures of new and enlarging mills presented below have been confirmed in advices to the MANUFACTURERS' RECORD from time to time. All the machinery reported for 1906 is not yet in position, but much of it has been placed, and the construction and engineering work involved in these enterprises is continuing steadily. During 1907 practically all of these installations will be completed.

The data gathered enables one to realize that the Southern cotton-manufacturing industry is progressing steadily. That it will continue to do so and keep pace with the advance seen in so many other branches of industrial activity during the present prosperous period of our country's history cannot be doubted in view of what has been accomplished during the past 20 years.

Attention may be first directed to the evidences of progress seen in what has been accomplished during the fourth quarter of 1906, as compared to the three other similar periods of the year. While this fourth quarter does not show the same aggregate of spindles and looms as the first and second quarters, yet it surpasses the third quarter, and the total for the year is far beyond the total credited to 1905. Ex-

amining the figures for 1906's fourth quarter, it is seen that the definite announcements of new mills are to install 34,500 spindles, and of established plants to add 130,664 spindles and 2287 looms, making a total of 165,164 spindles for both new and enlarging plants. This means the investment of $862,500 in new mills and $3,266,600 in enlarging mills, a total of $4,129,100. Following this may be noted the results of the entire year as compared with 1905. During 1905 there were 430,540 spindles announced for installation, and during 1906 there were 794,034 announced, an increase of more than 50 per cent. over 1905. A conservative estimate of the investment for 1905 is $10,763,500, and for 1906, $19,850,850, nearly double that of the previous year.

It may be well to refer in a general way to some of the important 1906 announcements. The most extensive enterprise is the plan of the Cannon Manufacturing Co. of Concord, N. C., and the Patterson Manufacturing Co. of China Grove, N. C. (both companies under the direction of James W. Cannon, their president), for investing about $1,250,000 for two mills, one of 30,000 spindles and 900 looms and the other of 20,000 spindles and 600 looms. These mills are under construction at Kannapolis, N. C., a new town on the Southern Railway, and are both additional to the big Cannon and Patterson mills, which have been successfully operated for some years. They will be driven by electricity from the developments of the Southern Power Co. of Charlotte, N. C. In connection with this it is interesting to mention that five mill companies of which Mr. Cannon is president have contracted for power (5000 horse-power) from the Southern Power Co. The Odell Manufacturing Co. and the Magnolia Mills, also of Concord, will obtain 1800 horse-power from the Southern developments. These contracts mean the extension of the Southern transmission lines from their present terminus to Concord, 17 miles distant. The Fulton Bag and Cotton Mills of Atlanta, Ga., is establishing a $150,000 branch at Dallas, Texas. The Standard Knitting Mills of Knoxville, Tenn., increased capital from $50,000 to $200,000 to build a 5000-spindle yarn mill for supplying its knitting machinery, also making other improvements. The Warioto Cotton Mills of Nashville, Tenn., is a 20,000-spindle and 500-loom proposition; this machinery will soon be in operation. The decision of the Ide Cotton Mills' directors is to build an addition of 25,000 spindles at Jacksonville, Ala.; this month the stockholders are to vote a $550,000 increase for this purpose; the McAden Mills of McAdensville, N. C., is building a 10,000-spindle adidtion, expending $50,000 for 2500 spindles and other machinery for the old mill, expending $25,000 for dyeing-plant improvements and other betterments, all aggregating $300,000; the Calhoun Mills of Calhoun Falls, S. C., plans 25,600 spindles and 740 looms, but to begin manufacturing with 15,360 spindles and 444 looms in position; the Aragon Mills of Rock Hill, S. C., plans 20,000 spindles and 600 looms.

The following table presents the title, location and equipment of the new and enlarging mills for October, November and December, 1906:

Name.	Location.	Spindles.	Looms.
Alabama.			
*American Net & Twine Co.	Anniston	10,000	....
*Ide Cotton Mills	Jacksonville	25,000	....
*Opelika Cotton Mills	Opelika	2,500	....
		37,500	....
Georgia.			
*American Textile Co.	Cartersville	5,000	128
Swift Spinning Mills	Columbus	10,000	....
*Walton Cotton Mill Co.	Monroe	5,000	....
		20,000	128
North Carolina.			
Smith Cotton Mill Co.	Bessemer City	6,000	....
*Randolph Mfg. Co.	Franklinville	1,664	54
Flint Mfg. Co.	Gastonia	5,000	....
Dudley Shoals Cotton Mills (included in previous list; credited to Dudley Lumber Co.)	Granite Falls	.....	....
*Pomona Cotton Mfg. Co.	Greensboro	10,000	....
*Cannon Mfg. Co. of Concord, N. C.	Kannapolis	30,000	900
*Patterson Mfg. Co. of China Grove, N. C.	Kannapolis	20,000	600
Dixie Cotton Mills	Mooresville	5,000	....
*Mooresville Cotton Mills	Mooresville	14,000	480
The Transylvania Company	Rosemary	.....	16
W. W. Glenn	Waynesville	6,000	....
Little River Mfg. Co.	Willardsville	2,500	....
		100,164	2050
South Carolina.			
*Toxaway Mills	Anderson	5,000	125
Enterprise Mfg. Co. (burlap bagging)	Rock Hill	.....	....
*Royal Bag & Yarn Mfg. Co.	Charleston	2,500	....
		7,500	125
Tennessee.			
*Trenton Cotton Mills (changing from cloth to yarn manufacture)	Trenton	.....	....
Texas.			
Fulton Bag & Cotton Mills of Atlanta, Ga. ($150,000 branch)	Dallas	.....	....
Virginia.			
Strasburg Textile Mfg. Co. ($100,000)	Strasburg	.....	....
Total		165,164	2303
Total for first quarter		190,652	2246
Total for second quarter		327,888	4488
Total for third quarter		110,330	734
Total for fourth quarter		165,164	2303
Total for year 1906		794,034	9871

*Established mills enlarging.

RESOURCES OF ARKANSAS.

Solid Basis of Little Rock's Industrial Future.

[Special Cor. Manufacturers' Record.]

Little Rock, Ark., December 28.

When Arkansas becomes better known Little Rock will become one of the leading industrial cities of the Southwest. The city has been feeling the impetus of both capital and energy during the past year, and is assuming a position commercially, financially and in a manufacturing way that is drawing the attention of the outside world to its borders in no uncertain measure.

I have from that capable, courteous and efficient worker for the city's interest, Geo. R. Brown, secretary Little Rock Board of Trade, the following statement, prepared especially for the MANUFACTURERS' RECORD, which shows a healthful increase of the city along lines of productive values:

Cotton, receipts from September 1, 1905, to December 1, 1906, 104,660 bales, an increase over the same period last season of 27,117 bales; stock on hand December 1, 1906, 44,422 bales, a decrease of 8730 bales.

Real-estate sales, 11 months of 1906, 2558; value, $3,164,415; in 11 months of 1905, 2337; value, $2,723,296, an increase of 221 in number and $441,119 in value.

Grain, receipts in bushels, 11 months of 1906, corn, 3,901,000; oats, 1,453,000; wheat, 266,000; total, 5,620,000; 11 months of 1905, corn, 2,158,000; oats, 1,291,000; wheat, 20,000; total, 3,469,000; increase in total, 2,151,000 bushels.

Grain, shipments in bushels 11 months of 1906, corn, 1,610,000; oats, 1,131,000; wheat, 235,000; total, 2,976,000; 11 months of 1905, corn, 1,023,000; oats, 883,000; wheat, 10,000; total, 1,916,000; increase in total, 1,060,000 bushels.

When it is understood that Little Rock is situated in the center of the State, with water transportation 12 months of the year, with railroads leading to every point of the compass, and surrounded by a great variety of raw material for the use of the artisan, it will be readily seen that this city has a future full of hope and promise.

Let us see why it is that every citizen of Little Rock has an abiding faith in his city in his State:

Every textile fiber used in the arts is grown in Arkansas.

The timbers of Arkansas are her glory and one of the greatest sources of her wealth. She has 129 native species of wood. Little Rock is in the center of this vast forest wealth.

The minerals of Arkansas are varied, while her acreage of coal is 2,500,000, with good thickness, and it ranges from lignite to nearly pure anthracite, and is adapted for steaming, cooking, gas manufacturing and domestic purposes.

The clays at and near Little Rock are wonderful in variety. They include every kind used by potters for making common salt glazed stoneware to the finest Sevres china.

I am indebted to the Hon. Guy Tucker, Commissioner of Mines, Minerals and Agriculture, also to J. E. Whitlock, the geologist of the State, both wide-awake and practical men, for the following information regarding the State:

This State has extensive antimony deposits and large bauxite deposits. The coal fields of Arkansas cover an area of 6,400,000 acres, consisting of anthracite, bituminous, semibituminous and a lignite. Most of the coal mined in Arkansas is of a very fine quality, equal to the richest semianthracite of Pennsylvania.

Arkansas has 13 counties underlaid with clays rich in aluminum, besides thousands of acres of fuller's earth, a portion of which is as good as that mined in England.

This State is rich in copper. The prospecting of today is showing wonderful indications of a large deposit.

Arkansas has 3,839,000 acres of iron, practically the same district as coal. Most all the iron is a limonite, or, in other words, brown hematite. Arkansas, with her 3,000,000 or more acres of iron, and her 6,000,000 acres of coal suitable for the making of coke, and her thousands of acres of limestone, will equal any other State in the iron industry in the near future. Arkansas has large deposits of manganese.

Arkansas has over 1,000,000 acres of lead and zinc.

In the mountains in North Arkansas the breaks in the mountains expose millions of tons of zinc carbonates. With the railroads penetrating the mineral district in a short time Arkansas will be a leader in lead and zinc.

Arkansas is blessed with thousands of acres of marl, the raw material for the making of Portland cement. An abundance of fuel in the same region enables Arkansas to produce a high-grade cement at a nominal cost.

Arkansas has an area of 1,408,000 acres of marble of all varieties. The pink and black are claimed to be superior to any yet discovered. The State contains inexhaustible beds of fine granite, from which many of the public buildings of the State are being constructed. The most noted of these is the State Capitol, now under construction.

In many localities in Arkansas is found large quarries of slate of every color, the black, blue and red predominating, all of which is practically undeveloped.

With all of these great natural resources, advantages and possibilities, is it any wonder that this State is challenging the admiration of the world and that the city of Little Rock is called a "City of Destiny"? Secretary George R. Brown of the Board of Trade says on that point:

"Let the MANUFACTURERS' RECORD watch, as it has so ably done for the past quarter of a century, every portion of our great South and Southwest, and see what Little Rock will accomplish industrially and commercially during the next two years. It will be amazed with our progress and advancement, just as the outside world will be with our industrial leaps forward."

Little Rock is forging ahead in all the channels of human endeavor, and today offers the prospective capitalist, investor, as well as home seeker, many and varied inducements to come down here and partake of the many advantages to be seen on every hand, where climate, soil and water vie with each other in making this section a veritable Garden of Eden.

ALEXANDER HELPER.

NATURAL GAS AT HUNTSVILLE.

Developments to Date and Prospects for the Future.

[Special Cor. Manufacturers' Record.]

Huntsville, Ala., December 24.

The New York-Alabama Oil Co. was incorporated under the laws of Delaware with $1,000,000 capital stock. Of this organization I am vice-president and general manager. We have put down 11 wells, and are now drilling two more. Of the 11 wells, we have 7 producers, 5 of them at Hazel Green, about 15 miles north of Huntsville, and 2 in West Huntsville, about 1¼ miles from the center of the town. These last two wells we are now using from. We have used the gas under the boilers in our oil mill, and are now lighting and heating our office with it and piping up a large number of stores and residences. Part of them are now in successful use of the gas. This gas is of a very superior quality, free from carbon, and has an oil base, so that there is absolutely no odor or smoke to the flame. It gives a splendid light with a mantle burner, and gives an extra good one with an open burner.

We have a franchise for the city of Huntsville, and are now piping towards the city. I am expecting a mile and a half of pipe here every day.

We have developed a very large gas area, and have about 40,000 acres of land under lease.

We own two drilling outfits of our own, and have a contract with the owner of another rig to put down 10 wells for us.

We are in a position to offer special inducements to manufacturing concerns who desire to use natural gas. I look for a considerable development of this field by reason of this wonderful find.

T. W. PRATT.

The British Cotton Growing Association, which is endeavoring to demonstrate that enough cotton may be grown within the British Empire to supply British spindles, estimates that it will need $250,000 this year and $500,000 next year for West Africa alone. Under the auspices of the association 20,000 bales of cotton were raised this year. The British mills take annually about 8,000,000 or 10,000,000 bales of cotton.

Nearly $20,000,000 Improvements Under Way in Baltimore.

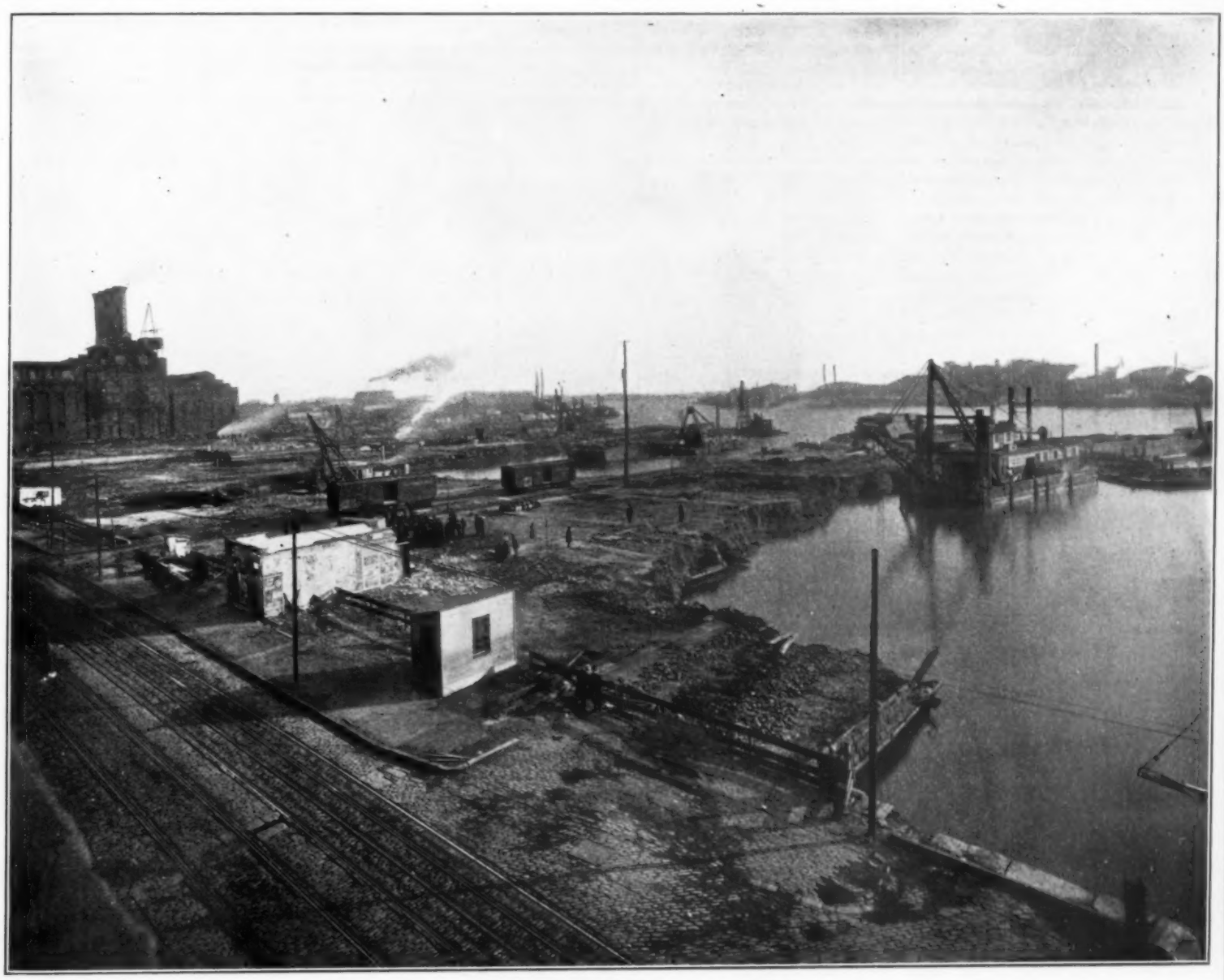
By William H. Stone.

[Written for the Manufacturers' Record.]

The year 1906 will go down in the annals of Baltimore as one of, if not the most important in this city's existence. Actual construction work on the municipal improvements, which are directly traceable to the great fire of 1904, was inaugurated during the year, and the work is now rapidly advancing. These improvements, which will involve an outlay of many millions of dollars, indicate as it is possible in no other way the broad and wide-awake spirit that has taken hold of its citizens, and so strongly has this spirit of modern municipalism manifested itself that it is not intended to stop with those which have been started, but to undertake more, the last State Legislature having passed enabling acts authorizing the city to submit to the votes of the people propositions to issue loans for many more millions to carry out other improvements. These loans will include $5,000,000 for a general improved paving scheme, $1,000,000 for new school buildings, $1,000,000 for increasing and otherwise improving the fire department and $1,000,000 for extending and connecting the general park system.

The improvements on which construction work was started during the year include the new $10,000,000 sewerage system, $6,000,000 dock system, $2,000,000 annex improvement system and $1,000,000 park extension system.

But in addition to these, many other improvements, involving an outlay of considerable money, were either completed or contracted for during the year. These include approximately $500,000 far paving in the city proper, $1,250,000 for construction of new buildings, exclusive of land and equipment, and the regular annual appropriations for various departmental purposes.



GENERAL VIEW OF THE NEW DOCK DISTRICT.

By far the most important of these municipal improvements are the new sewerage and dock systems.

The magnitude of the task of building a complete sanitary and storm-water sewerage system for a city of 600,000 inhabitants is almost beyond the comprehension of the layman. Imagine for a moment a city covering an area of 30 square miles and containing 111,561 separate and distinct buildings from which sewage is to be taken; imagine the great network of approximately 700 miles of pipe and concrete sewers that have to be built to carry this sewage; imagine the large area of ground that has to be supplied with septic tanks and filtration beds to reduce this sewage to absolute purity in order not to contaminate the valuable oyster beds of the Chesapeake bay; imagine a tremendous pumping station, one of the largest in the world, to pump this sewage from the low-lying sections of the city to the disposal plant; think of the thousand and one details, such as tests, surveys, calculations, making of maps, plans, specifications, etc., which it is necessary to prepare for a work of this character. Having absorbed these few general details that would be necessary to consider to supply an area of this size with sewers, where there are no obstructions, think of the many engineering problems that have to be worked out when there is already under ground a complete network of gas, water and other pipes and conduits for carrying electric wires; the acquiring of land and rights of way through the slow and tedious process of legal condemnation and the bringing together of all of these details into one systematic whole.

The magnitude of the undertaking, considered from the standpoint of details that had to be worked out, is, in itself astounding.

The responsibility of carrying this great work to a successful culmination rests particularly upon the chief engineer, Mr. Calvin W. Hendrick, and when it is considered that his office force was only organized in January, 1906, and the close of the year discloses the fact that all of these details have been practically worked out and put into systematic shape for future reference, and that contracts for construction work aggregating nearly $1,000,000 have been awarded and started, the results accomplished border on the marvelous and carry convincing assurances that the working out of Baltimore's undertaking was placed in proper and capable hands. Immediately upon organizing his force in the early part of last January Chief Engineer Hendrick was kept busy furnishing the advisory engineers with tests of soil, analyses of sand, population data, past, present and future: maps, tables, charts, surveys of all streets and much other necessary information to assist them in working out the system to be recommended. This report of the advisory engineers was submitted to the Sewerage Commission on June 1, and was adopted and the disposal plant located near Back river, about seven miles from the city. As the whole system hinged on the location of the disposal plant, active work of locating the principal sewers was started when this decision was reached. This work was pushed rapidly, as was also the system of storm-water drains, which will be operated independent of the sanitary sewerage system.

Plans were prepared for a complete storm-water drainage system 123 miles in length and covering the entire city, and contracts, being the first, were awarded in October for approximately 10 miles of these drains, scattered in various parts of the city where the conditions were the worst. This contract involved an outlay of $152,900, and was awarded to M. A. Talbott & Co. The drains are being constructed of concrete pipe made under the system of the Reinforced Concrete Pipe Co. of Jackson, Mich. They are made on the job with sheet-steel forms, reinforced with steel bands, and when laid are connected by concrete joints, so that the whole line of pipe will form one continuous solid concrete tube. This is accomplished by having the ends of the pipe rebated, so as

to leave a recess at the joint, into which the longitudinal members of the reinforcing steel project in such a manner that a steel band can be introduced, circumferentially locking the sections together. The joint is then completed by pouring thin cement mortar into the recess, filling it completely. From 3000 to 4000 feet of this pipe has been laid, and the modern methods of handling and putting it into place with the least possible delay are shown in the accompanying illustration. Sections of these storm-water drains will be laid from time to time until the whole system is completed.

In order to ascertain if any improvements or changes could be made to the recommended plan of the advisory engineers for the sanitary sewers that would really only represent an outlay of a few thousand dollars for the temporary laboratory and testing plant, and was well worth the undertaking.

The next contracts to be awarded were those for portions of the main outfall sewer, sections 1 and 2, and were also given to M. A. Talbott & Co. at their bid of $281,058. These sewers, which will be horseshoe-shaped, 12 feet in diameter, will be constructed of concrete. They will form part of the whole main outfall sewer, which will be about seven miles in length and which will carry the entire sewage of the city from the high-level interceptors and the pumping plant to the disposal plant.

In December contracts were awarded to the Bethlehem Steel Co., at its bid of

VARIOUS STAGES OF NEW DOCK CONSTRUCTION.

render it less expensive, to test the various sizes and kinds of stones and other materials for filtration purposes and to determine other pertinent questions an experimental testing plant of 50,000 gallons daily capacity is being constructed at Walbrook, in the northwestern part of the city. The accompanying illustration gives a splendid view of this plant, showing the septic plant in course of construction on the right, the laboratory in the center and the filtration beds on the left. This plant will be a minature form of the complete recommended system, and contracts for its construction were awarded in the latter part of October, and it is expected that it will be in active operation by July 1, 1907. After having served its purpose it will be connected to the high-level interceptor sewer, so that the whole experiment will

$450,000, for the entire mechanical equipment for the immense sewage pumping station.

This equipment consists of the following: Three vertical triple-expansion sewage pumping engines, each having a rated capacity of 27,500,000 gallons in 24 hours and to have maximum output for short periods of 50 per cent. excess over rated capacity; two centrifugal pumps direct connected to two vertical compound drainage pumping engines, and each having a rated capacity of 300 gallons per minute with 25 per cent. overload; three water-tube boilers, one fuel economizer, one electrically-operated traveling crane of 54-foot span and equipped with 20-ton hoist, main and auxiliary smoke flues, dampers and damper regulators, feed-water heaters, auxiliary boiler-feed pumps and condensors for sewage and drainage pumping engines.

The contract calls for this equipment to be complete and in operation within 33 months after signing the contract.

This plant will be so arranged that additional units can be added when needed, according to the growth of the population and extension of the city.

This indeed makes a most remarkable record of achievement in so short a time, for no actual work of a definite character was possible until the advisory engineers' reports had been received, which was on June 1, so that all of this vast amount of work was really accomplished within seven months.

The commission in laying out its program determined that it would be unwise to undertake construction of any of the smaller sewers until they could be put into immediate service, and it was therefore decided to start at the disposal plant and work backward. This involves laying out of the septic tanks and filtration beds and putting them into shape, constructing seven miles of main outfall sewer, erection of pumping station and installation of mechanical equipment, as all of these must be completed before any sewerage can be handled at all. Then will follow the construction of the high and low-level interceptor sewers, which will be the main arms of the outfall sewer. These will extend clear across various parts of the city, and all of the small sewers leading to the various buildings will be connected to them. The high-level interceptor sewer will receive all of the sewage from that portion of the city above 60 feet above sea-level, and it will be carried by gravity to the main outfall sewer, while the low-level interceptor sewer will receive the sewage from that portion of the city below 60 feet above the sea-level, and this will be forced to the main outfall sewer by the pumping plant. From the main outfall sewer it will be carried by gravity to the disposal plant, reaching there at a point 35 feet above sea-level, so that it can be passed through the various stages of purification entirely by gravity. Thus it will be seen that mechanical operations of the system has only been used where absolutely necessary, and that the main operation will be by gravity.

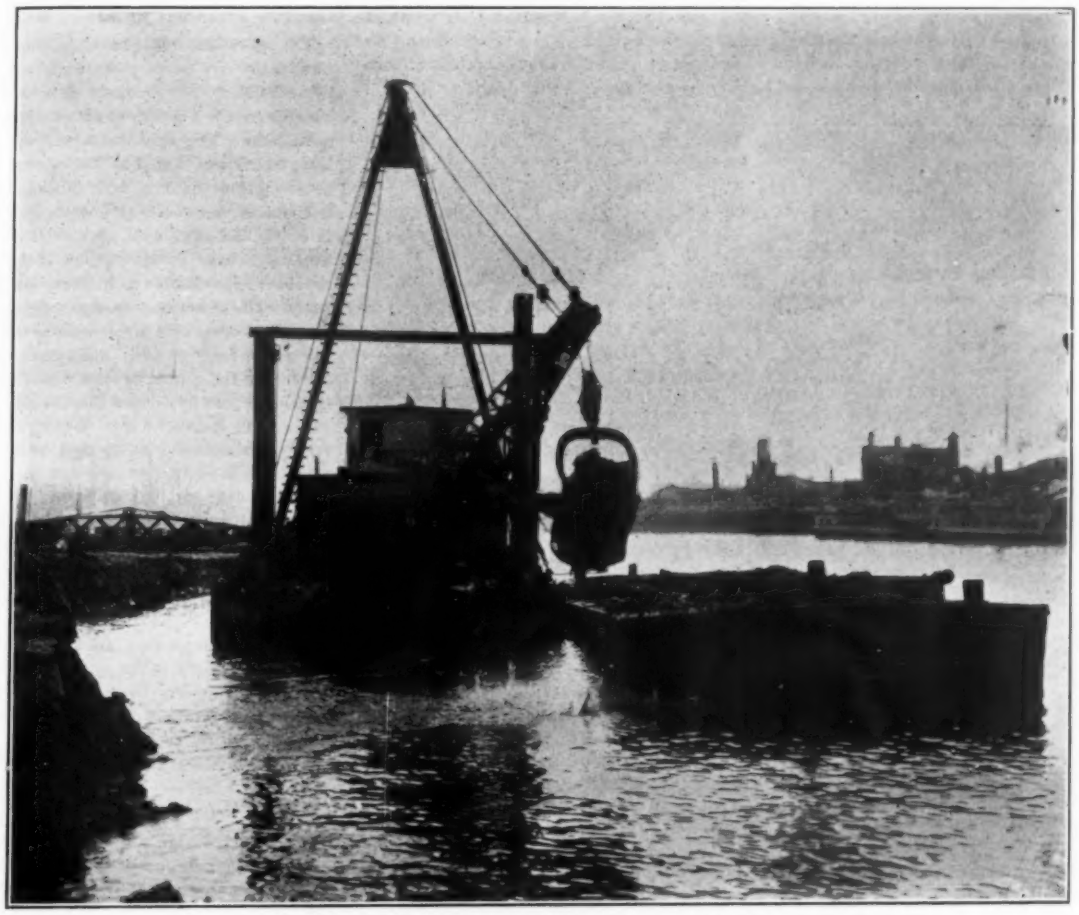
The aggregate amount of contracts awarded during 1906 was $927,870, while approximately $3,500,000 has been laid aside for work to be done in 1907, when many important contracts will be undertaken.

Splendid progress is also being made on the new dock system. The contracts for the construction of piers 1 2 and 3 were awarded on February 7, 1906, the second anniversary of the beginning of the great fire, and it was a fitting commemoration of that disastrous event. The contract for the Pratt-street bulkhead was awarded shortly afterwards. The aggregate amount of these two contracts was $293,474, including $230,972 for the piers and $62,502 for the bulkhead.

This was another large undertaking, involving practically the cutting away of the three old piers and building new ones, filling up old docks and dredging new ones

and completely rearranging the old layout.

Most municipal improvements are usually of such a character and scattered over so wide an area that it is impossible for the ordinary citizen to comprehend the vastness of the undertaking. Here it is different, and those whose civic pride and interest or curiosity induced them to inspect the work could not help but being struck with the wonderful methods of modern contracting on a large scale. Here the whole operation can be seen and comprehended at a glance—the excavation work by the dredges, driving of piles to form the foundations for the piers, cutting off of these piles and placing the huge timber caps and ties in place and the laying of the stone wall which forms the exposed exterior above water line. Dredges, large and small, with each movement of their tremendous arms and powerful scoops are rapidly obliterating the old landmarks. Over by historic Bowly's wharf an enormous dredge, known as the Degnon, more powerful than any of the others, at each stroke of its powerful arm is removing from five to six cubic yards of earth weighing from 10 to 12 tons, and bringing up piles, timbers and debris that has been at the bottom of the river and under the old docks for years. Surprising indeed is the fact that although the structural work of these old piers had been in the water for years, when removed they were found to be in a fair state of preservation and would have lasted for some time to come had not the old piers served their purpose and increasing commerce demanded better and more modern facilities. Two other smaller dredges of the dipper type are also doing excellent work, and the total amount of daily excavation by all of the dredges will average 1200 cubic yards, or about 2400 tons. As fast as these dredges complete a section of excavation the piledrivers follow rapidly in their wake. There are four of these machines, and they have been averaging 20 piles a day each. This work was hampered somewhat by the difficulty in getting the piles to their full depth, and it was found necessary to rig up a jet, which consists of a stream of water being forced through a pipe extending to the bottom of the pile to wash away the hard sand and gravel.



BIG DREDGE IN OPERATION ON NEW DOCKS.

The new piers are rapidly assuming shape, as is indicated by the many piles which have been driven and other work started. These outline the new structures and give some idea of their splendid and symmetrical proportions.

On pier 1 the powerful dredge referred to is rapidly finishing up its work of excavation, and within a short time it will be ready for the piledrivers to start to work. On pier 2 the excavation has been completed to a depth of 20 feet, leaving four feet yet to be dredged, and all of the piling has been driven on the end and east side, and piledriving has been started on the west side. On pier 3, which is the furthest advanced in construction, the excavation has also been completed to a depth of 20 feet, leaving four feet yet to be dredged, and all of the piling has been driven and 20 per cent. of the timber and 10 per cent. of the masonry put in place. The completion of this portion of masonry work on this pier, as shown in illustration, gives an idea of the strong and substantial manner in which the new piers are being constructed, and it shows just how they will appear when fully completed. Taken altogether, the total excavation of 450,000 cubic yards is 60 per cent. completed. The method of constructing these piers consists of a bulkhead 23 feet wide being built around the outer edge of each pier, and the enclosed space filled in with earth. This bulkhead is formed of two outer rows of piles 36 feet long, with a row each of 30, 27 and 25-foot piles, making the total width of 23 feet. The piles are then cut off one foot below mean low tide and caps consisting of 12x12-inch Georgia pine timbers are securely fastened lengthwise on top of the piles, Georgia pine ties of the same dimensions and 23 feet 6 inches in length are then placed crosswise 8 feet on centers, while on the outer edge, halfway between the long ties, shorter timbers, known as jackties, will be placed to strengthen the foundation for the outer walls of masonry. Flooring 6x12 inches is then placed lengthwise on the timber ties, the masonry erected on the outer edge and sheet piling 6x12 inches driven on the inner edge to hold the earth filling. This completes the construction of bulkheads for the piers, which are then to be filled with earth and a paved driveway constructed in the center, leaving space on either side for the erection of warehouses.

The Pratt-street bulkhead will be constructed in the same manner, and it will be joined to the new piers. This bulkhead, which will be 60 feet wide, will be built at the head of each of the docks from Concord street to Light street, and it provides for the widening of Pratt street to 120 feet. That portion of the work between piers 4 and 5 and 5 and 6 has been

LAYING REINFORCED-CONCRETE STORM-WATER DRAINS.

completed ready to be connected to piers 4, 5 and 6 when they are finished, while that portion between piers 2 and 3 and 3 and 4 is well under way. Some idea of the amount of work involved in the construction of piers 1, 2 and 3 can be ascertained from the following approximate quantities:

Old wharves and bulkheads, 4812 lineal feet; filling behind new walls, 31,576 cubic yards; excavation above M. L. W., 57,250 cubic yards; excavation below M. L. W., 450,000 cubic yards; yellow-pine piles under wall, 2365; yellow-pine piles in rear of wall, 1610; yellow-pine piles in alternative fender, 568; white-oak piles (corner fenders), 27; yellow-pine timber in foundations, 1,553,750 feet B. M.; yellow-pine timber in alternative fender, 59,000 feet B. M.; white-oak timber in fenders, 54,900 feet B. M.; masonry, 2851 cubic yards; concrete, 187 cubic yards; coping, 4492 lineal feet; iron (exclusive of shoes), 6755 pounds, and treenails, 42,555.

These piers are to be completed, according to contract entered into with the Degnon Contracting Co. of New York, by September 15, 1907, at which time construction work will commence on piers 4, 5 and 6. Building the piers in sections was necessitated by the lack of docking space in the harbor.

Taken altogether, the six piers will have a total of 11,000 lineal feet, or about two miles of wharfage. The total area of all of the piers is 1,026,802 square feet, but 320,000 square feet of this is to be taken up by streets, so that the 706,000 square feet left will constitute the available rental area, which is about the same area that existed in that district prior to the fire. This area will be rented at a rate which will provide for the interest on the dock loan and a sinking fund to take it up at its maturity. Space on pier 4 will not be rented, but will be devoted to the use of the bay craft which bring produce and fish from the tidewater counties. This pier was selected for this purpose, as it is closest to the new fish and produce markets on Market place.

The width of the harbor in the narrowest part will be increased about 200 feet, and the area of navigable water will be increased 280,000 square feet, while the increased width of waterway in the new docks will raise the total increase of water surface 730,000 square feet, or about 17 acres, which means an additional supply of tidal water daily of nearly 15,000,000 gallons.

The cost of the land which it was necessary to purchase to obtain the required amount for the dock system approximated $3,200,000, and this, together with the estimated cost for constructing the whole system of $1,000,000, makes the total investment $4,200,000.

Much paving work was either completed or contracted for during the year. All of this work was done with modern materials and laid according to the most approved methods. The total of this work done by both the City Engineer's department and the Commissioners for Opening Streets was 351,678 square yards, including 187,750 square yards by the City Engineer and 163,928 square yards by the Commissioners for Opening Streets, and costing in the aggregate approximately $1,000,000.

The work done by the City Engineer was in the city proper, while that of the Commissioners for Opening Streets was done under the $2,000,000 annex improvement loan. The first instalment of this loan, which was passed by the votes of the people under enabling acts of the State Legislature, became available on January 1, 1906, and amounted to $500,000, the legislative act providing that that sum should be available each year for five years. The object of this loan was to condemn and open new streets, purchase old turnpikes and to pave and curb those streets in the annex, which would bring the annex property under the full city tax rate of $2, instead of the 60-cent county tax rate which was being paid under an existing law, which provided that this rate should be paid until the streets were paved all around a block and certain other conditions complied with. According to the plans as laid out by the Commissioners, this will be worked out in the five years the loan runs.

It is anticipated that this loan will not in any way increase the city tax rate, as the annex property to be brought under the full city rate will provide not only for the interest on the loans, but will also provide a sinking fund to meet it at its maturity.

During 1906 not only were many of these annex streets paved with improved materials, but several of the old turnpikes were also purchased and contracts awarded for paving them.

For the first time in the history of the city, bitulithic was used for paving. This class of paving was inaugurated by the Commissioners for Opening Streets, but not until after a strenuous legal battle with the so-called asphalt trust, which fought its introduction to the Court of Appeals, the highest court in the State. A total of 72,627 square yards of this material was laid or contracted for by both the City Engineer and the Commissioners at an outlay of approximately $200,000. Other pavements laid or contracted for

GENERAL VIEW OF LABORATORY AND TESTING PLANT FOR SEWERAGE SYSTEM.

FISH AND PRODUCE MARKETS WHEN IN COURSE OF CONSTRUCTION.

during the year by these two departments include the following:

49,921 square yards vitrified brick, costing approximately $125,000.

77,025 square yards asphalt bricks, costing approximately $225,000.

54,785 square yards granite blocks, costing approximately $180,000.

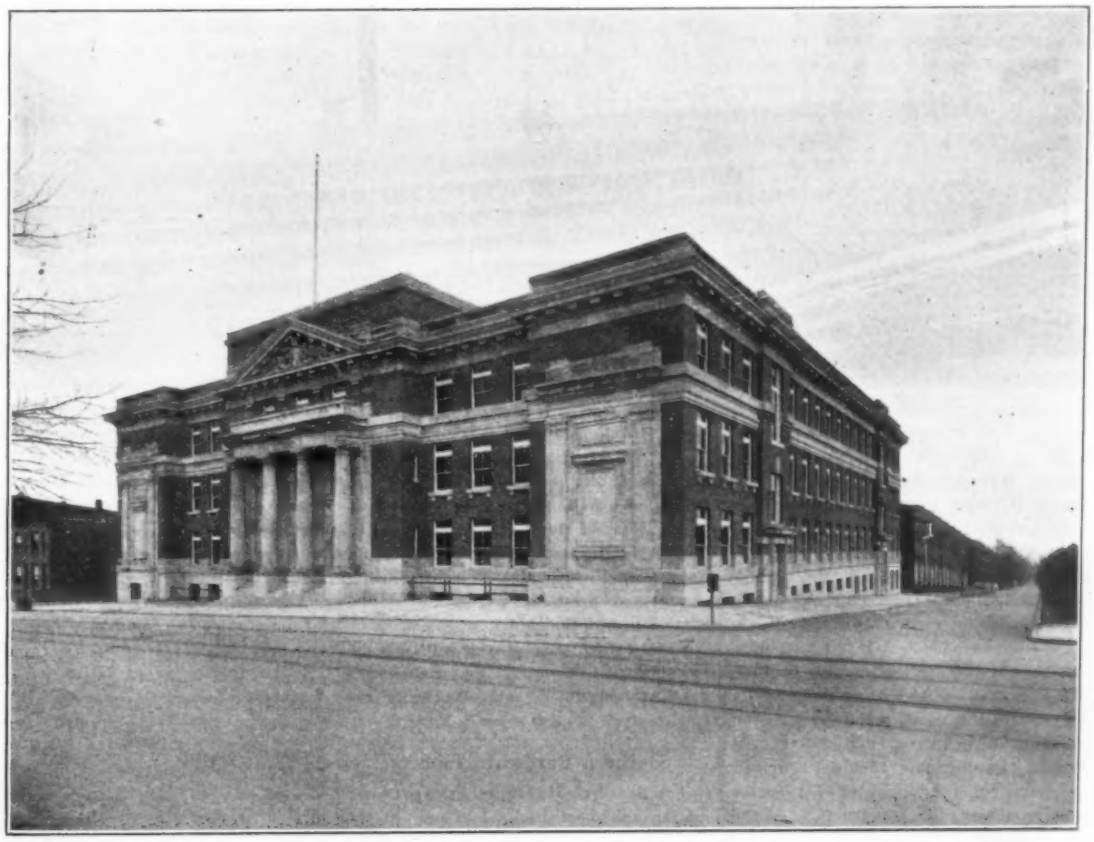
20,620 square yards wooden blocks, costing approximately $75,000.

16,660 square yards sheet asphalt, costing approximately $36,500.

12,729 square yards macadam, costing approximately $16,367.

This last item does not include macadam laid on the St. Paul-street boulevard. This boulevard is being built in two sections, one by the residents of Roland Park, a residential suburb of Baltimore, by voluntary subscriptions, and the other by the city, amounting in all to about $100,000, exclusive of a concrete bridge of the monolithic type to be erected in 1907 by the city at an approximate cost of $50,000.

New municipal buildings erected during the year made a splendid showing. These included markets, schools, fire department buildings and hospitals, and the total amount involved in this work, both for structures completed during the year and those contracted for, was nearly $1,250,000, exclusive of the cost of ground, equipment and architects' fees.



THE MODEL EASTERN FEMALE HIGH SCHOOL.

During the year five schools were completed at a cost of $544,779, and another was contracted for at $34,200, making the total for schools $578,979. The most important of these structures was the building for the Eastern Female High School, the cost of which for actual construction alone was $312,000. This is without doubt the finest school building in the city, and its architectural merits can be appreciated in the accompanying illustration. It is three stories and basement in height and covers an area of 196x200 feet. The exterior is constructed of brick with a granite base and terra-cotta trimmings, while the interior has been finished with the single purpose of providing the latest improved methods of modern school construction. The building contains 35 classrooms in addition to the music-room and physical, biological and chemical laboratories and lunch and cloakrooms. For general assembly purposes a large hall seating 1200 people has been provided on the first floor. A gymnasium and shower baths are located in the basement, and a playground has been laid out on the roof. Taken altogether, it represents all the most improved ideas looking to the comfort and health of the pupils.

Of no less importance and of equal merit in their line are the three market buildings in course of construction on Center Market space, now known as Market place. Prior to the fire these markets were located in the bed of the street, with a narrow driveway on either side, and consisted of a building occupied by the Maryland Institute for the Promotion of Mechanics' Arts, under which was the retail market, while mere sheds served the purpose of the wholesale fish and produce markets.

The plans for the new structures, now rapidly nearing completion, provide some very decided and modern improvements. They have been removed from the center of the street and placed on the eastern side of that thoroughfare, leaving the street an unobstructive driveway 150 feet wide and extending from Baltimore street to the water front to pier No. 4, which, when completed, will be given over to the use of bay vessels bringing produce, fish, etc., to the markets.

The retail market and night school of the Maryland Institute, which is three stories in height, covers an area of 7700 square feet; the fish market, two stories in height, an area of 5130 square feet, and the produce market, two stories in height, an area of 44,164 square feet. These three buildings facing on this broad and spacious driveway present an imposing and symmetrical appearance, and are of an architectural design that is most pleasing. An idea of how they will appear is shown in the illustration of the fish and produce markets in course of construction. The exteriors are constructed of brick with terra-cotta trimmings, while the interior framework is of steel fireproofed with concrete. They are of a substantial character in every particular, and will be equipped with every facility for the conduct of business by their occupants. Offices will be provided on the second floor of the fish and produce markets, and by a system of dumb-waiters and speaking-tubes they can keep in constant touch with the salesmen on the floors. The cost of actual construction work on these buildings aggregates $436,827. For their purpose they are unexcelled in the whole country.

Three new buildings for the fire department, including two engine-houses and one truckhouse, were completed during the year at an aggregate cost of $84,187, exclusive of land and equipment, and contracts were awarded at an aggregate amount of $73,663 for constructing three additional truckhouses, making the total outlay for the fire department $157,850. These structures are all two stories in height, and are equipped with every facility for their purpose.

Other buildings erected include a new administration building at Bay View costing $27,500, addition to the city jail costing $17,000, and new offices erected in the light courts of the City Hall at a cost of $10,000.

Under the $1,000,000 park loan many improvements and extensions have been inaugurated by the Park Board, all of which are toward one definite aim—the Olmstead plan. When the question was first taken up looking to the extension of the municipal park system Mr. Frederick Law Olmstead, one of the best landscape engineers of the country, was engaged to lay out a general scheme and definite aim to be followed in all future development. This plan involved a total outlay of $3,000,000, and it was first employed under the loan referred to, while an additional loan for $1,000,000 was authorized by the last legislature. In order to show no partiality, these legislative acts provided that the money should be spent in equal amounts in the four sections of the city. This was considered by Mr. Olmstead in laying out his plans, which provide for a chain of parks connected by broad boulevards extending almost entirely around the city.

The Electrical Commission, which has in charge the construction and maintenance of the subways for carrying electric wires, has also been quite active during the year. Up to the 1st of January, 1906, 5,303,304 duct feet of conduits had been laid, covering 43 lineal miles of streets. During 1906 about $180,000 was spent in extending this system, and about $200,000 has been appropriated for the same work in 1907.

The water department has been kept busy maintaining its service, and while no construction work was undertaken out of the ordinary in 1906, a new high-service reservoir is to be constructed in 1907.

In awakening to its needs Baltimore is to be commended, and in providing the money to meet these needs the city is to be congratulated. The completion of the improvements now under way will place the city in the position where it belongs, shoulder to shoulder in the ranks of the progressive cities of this thriving country. Too long has it held back in providing those requisites of modern cities, and it is safe to predict that when the present ones are completed the general satisfaction experienced in the exercise and enjoyment of them will be so great that others of equal merit will be undertaken.

OF REINFORCED CONCRETE.

Notable Structure of the Louisville & Nashville Terminal Station at Atlanta.

[Special Cor. Manufacturers' Record.]

Atlanta, Ga., December 29.

One of the most notable reinforced concrete structures, not only in the South but in the entire country, is nearing completion. It is the new Louisville & Nashville freight terminal station and warehouses at Atlanta, a view of which is presented by the accompanying illustration.

The Louisville & Nashville Railroad, one of the main trunk lines of the middle Southern States, is the owner, and the size and character of the structure serves to emphasize the magnitude of the freight traffic the company controls. The main dimensions of this building are: Width, 50 feet; length, 853 feet, and height, five stories, or 65 feet from first floor to eaves. In the west end now being constructed there is a basement 50x96 feet. In the cross-section there are three bays, 16 feet 8 inches each, and lengthwise of the building 69 bays about 12 feet each. Through the center of the building there passes the Washington-street viaduct, a structure that has a length of 1546 feet, being 60 feet wide. The north end is being constructed of reinforced concrete, and south of terminal station the viaduct is to be of structural steel girders.

The actual available floor space of the warehouse is 201,200 square feet. The concrete used amounts to 10,000 cubic yards, and 600 tons of reinforced metal. The storage-rooms have the following heights: Foundation in basement to first floor, 25 feet; first to second floor, 15 feet, and second, third, fourth and fifth floors, 11 feet 6 inches each.

A few words on the structural features are of interest. Floor slabs are five inches in thickness, have three-quarter-inch wearing surface, and are reinforced with three-eighths-inch twisted bars about five inches on centers. The beams run crosswise of the building, 6 feet on centers, 7 inches thick and 16 inches deep, 16 feet 8 inches span, and every other beam connects direct to the columns. The girders run lengthwise, are 8 inches thick, 17 inches deep, 12-foot span. The bars used in the beams and girders vary from three-quarters to one inch and are of twisted type. Stirrup bars arre used to take up the shearing stresses of the concrete. Below the reinforcing bars on all beams and slabs there is a thickness of one inch of concrete. The footings of the building

are designed for a bearing of two tons per square foot, and average about nine feet and six inches square, being reinforced with twisted rods. The curtain walls are six inches thick, reinforced with twisted bars. The columns have the following thicknesses: Basement floor, 20 inches square; first floor, 18 inches square; second floor, 16 inches square; third floor, 13 inches square; fourth floor, 11 inches square, and fifth floor, 9 inches square. These are reinforced with plain round rods at the four corners, bound together with hooks. The floors are designed for a working load of 300 pounds per square foot, and are to be tested to 1200 square feet without fracture or sign of weakening.

The roof slab is two and three-quarters inches thick, and is covered with tar and gravel roofing.

All doors, windows and ventilating forms are metal, being built directly into the walls. The floors have cement wearing service except in the two end bays of the building on the main floor, where the offices are located. The floors are of hardwood, being maple.

The concrete in the structural portion of the building, including beams and columns, is 1-2-4 mixture, and the walls and foundations are 1-3-6 mixture. All stone used passed through a one-inch mesh, down to crusher run. Special mention is made of the character of the work that was done in placing the foundations under the basement. The ground at this point was exceedingly damp and caved in continually. The contractors were unable to dig out more than four feet beyond the building line, consequently they had to use a great deal of sheet piling to hold back the surrounding earth.

There is also a power plant connected with the building for heating and lighting purposes. The pipes and wires for it and for the telephones, telegraph and signal systems are in conduits throughout the entire structure, there being no exposed surfaces. There is a reinforced concrete chimney seven feet six inches square, extending from basement to 10 feet above the roof. This stack has nine-inch walls, lined with firebrick, there being an air space of four inches between the wall and brick, the walls being reinforced with twisted bars. The building at the present writing presents a most imposing appearance, as the roof is about completed, and the contractors are putting on the finishing touches. One of the most striking features is the manner in which the Washington-street viaduct passes through the center.

It is of further interest to know details of the contractor's plant used on this structure. The plant includes three hoisting engines, one rock-crushing plant, three 20-cubic-foot Smith mixers, three one-yard Ransome hoisting buckets, two platform elevators, a tramway for handling excavated material, and Ransome concrete carts for conveying concrete from bins. The woodwork shop is 20x100 feet, employing about 60 carpenters. Its equipment is one cross-cut saw, one rip saw, one power boring machine and drill, all driven by one 10-horse-power electric motor operated by city current. The forms of the building were built on stationary benches, and 750,000 feet of long-leaf yellow pine were used, the forms being treated with paraffine oil.

In connection with the building, 50 carpenters in from four and one-half to five working days would erect a section of the building, not including the walls, 360 feet long. This, of course, refers to the structural beams, columns and slabs, etc. The structural features were not dependent upon the curtain walls, which were built afterwards. In all, about 275 workmen were kept busy upon this structure. All stone and sand were secured locally, cement being made by the Southern States Portland Cement Co., Rockmart, Ga. The steel was rolled by the Atlanta Steel Hoop Co., where the contractors kept a twisting machine for the purpose of twisting their bars. This building is particularly interesting because all the material was made locally. The foundation was broken for the building in June, and construction has advanced rapidly. The contractors were the Ferro-Concrete Company, Cincinnati, Ohio, W. P. Anderson, president and engineer; engineer in charge of the work, H. E. Curtis; superintendent of construction, Louis Nolte; resident engineer for the Louisville & Nashville, W. F. Schultz. The contractors have made a most notable record on this building and feel justly proud of their work. P. H. NORCROSS.

LOUISVILLE & NASHVILLE RAILROAD TERMINAL BUILDINGS AT ATLANTA, GA.
Station and Warehouses Constructed of Reinforced Concrete.

THE SOUTHERN POWER CO.

Its Development Work Is Progressing Steadily in North Carolina and South Carolina.

Several weeks ago the MANUFACTURERS' RECORD referred to the Southern Power Co. of Charlotte, N. C., as awarding contracts for the hydraulic and electrical machinery for its two new developments at Ninety-Nine Islands on the Broad river and at Rocky Creek on the Catawba river, South Carolina. It is now announced at Charlotte that in about another month the plant at Great Falls, S. C., on the Catawba river, upon which construction work has been in progress, will be prepared to furnish electricity to Mt. Holly, Belmont, Lowell, Dallas and other cities in the Charlotte section. When this plant is operating the large force of laborers employed will be transferred to Rocky Creek and another large force will be engaged at Ninety-Nine Islands. Referring to the progress of the Southern Power Co.'s work, the Charlotte *News* recently said:

"The plant at Great Falls will have a total output of 44,000 horse-power, to be transmitted to connect with the Catawba plant, between 30 and 40 miles up the river. The towers and iusulators the entire distance are up, and wire is being distributed along the route as rapidly as possible in order that power may be transmitted over the line just as soon as the machinery is installed in that plant.

"The huge dam at Great Falls, which is approximately 1000 feet wide, was closed this week; the river is harnessed, and just as soon as the water-wheel is placed in position the several hundred carloads of machinery, costing upward of $400,000, will be placed into commission. More than 150 carloads of this machinery is already delivered and is being placed in position as rapidly as possible.

"With the transmission lines up from a distance of four miles north of Clover, S. C., to Gastonia, Lowell, McAdensville and Mt. Holly, the Southern Power Co. will be able to supply soon after the first of the year nearly 75,000 horse-power to the manufacturing plants in Charlotte and the towns in its vicinity. Lines are being constructed from here to Mooresville, Statesville and Concord.

"The plant at Rock Creek will be a sister plant to the one at Great Falls, with duplicate machinery and identically the same output, 44,000 horse-power."

Southern Hardware Jobbers.

The Southern Hardware Jobbers' Association will meet June 11-14 next at the Jefferson Hotel, Richmond, Va. Making that announcement, Secretary W. W. Webber of Fort Smith, Ark., adds:

"In this connection I do not think it amiss to urge our members to make strenuous efforts to be in attendance. Richmond presents some points of rare interest, and being associated with some of the dearest traditions of the South, is peculiarly fitted to call forth the largest number of our members ever assembled. Unless we attend on these meetings, give our best thought and talent to the deliberations there had, we can never hope to assume that commanding position to which we are entitled. The Jamestown Exposition is near, and doubtless an arrangement for a trip there can be perfected."

Mineral Production by States.

A new feature of the 1905 number of the volume, "Mineral Resources of the United States," brought out annually by the United States Geological Survey, is a series of tables, compiled by Mr. Wm. Taylor Thom, which shows the value by States of the mineral products of the country.

These products, so listed, include both certain raw materials and also certain derivative materials in their first marketable condition which do not appear in the table of mineral products of the United States as a whole. For example, both pig-iron and iron ores are included as important products entering into the commerce of certain States, and in like manner are included both pig lead and lead paints, both clay products and raw clay, both coal and its immediate derivatives, coke, gas coke, illuminating gas, ammonium sulphate and coal tar, bauxite and aluminum, and also alum and aluminum sulphate. These derivatives and raw materials are here given, regardless of the consequent duplication of values, in response to a constant demand for this information thus arranged by States.

Study of these tables will afford most people more than one surprise. For example, we think of Colorado and California as our most representative mineral States, and yet the actual value of Illinois' mineral products was far greater than that of either Colorado or California last year; more than double, in fact, the value of California's output, for although Illinois has neither silver nor gold, it produces great quantities of cement, clay, coal, pig-iron, stone and zinc, which are worth much silver and gold in the world's markets.

The sums total of these State outputs for the year run as follows:

Alabama	$53,585,288
Alaska	16,483,759
Arizona	41,346,134
Arkansas	4,470,784
California	43,406,258
Colorado	59,280,944
Connecticut	4,098,625
Delaware	762,944
District of Columbia	317,021
Florida	4,828,783
Georgia	6,300,654
Idaho	16,768,855
Illinois	105,065,567
Indiana	41,781,678
Indian Territory	5,763,346
Iowa	16,098,028
Kansas	37,971,198
Kentucky	14,871,811
Louisiana	6,815,430
Maine	5,065,804
Maryland	20,648,257
Massachusetts	14,024,200
Michigan	81,760,141
Minnesota	41,305,375
Mississippi	874,279
Missouri	23,035,899
Montana	66,501,049
Nebraska	1,357,846
Nevada	9,873,385
New Hampshire	2,028,638
New Jersey	31,818,121
New Mexico	4,382,114
New York	65,056,287
North Carolina	2,486,063
North Dakota	665,480
Ohio	169,203,710
Oklahoma	623,333
Oregon	2,441,973
Pennsylvania	569,828,673
Rhode Island	1,327,795
South Carolina	2,494,457
South Dakota	7,571,573
Tennessee	19,641,528
Texas	13,752,346
Utah	28,447,799
Vermont	8,797,834
Virginia	21,751,986
Washington	8,790,544
West Virginia	74,731,376
Wisconsin	16,804,611
Wyoming	8,657,202

The chapter of "Mineral Resources" entitled "Summary of the Mineral Production of the United States in 1905" is issued separately in pamphlet form. Those desirous of knowing the details of State production should make request for this summary from the director of the United States Geological Survey, Washington.

A PLAN TO FACILITATE SOUTHERN IMMIGRATION.

By HERMAN BADENHOOP, Baltimore, Md.

[Written for the Manufacturers' Record.]

Just at this time there is under consideration in Congress a bill for the purpose of restricting immigration, inspired principally by the American Federation of Labor. On the other hand, I read in the papers from all parts of the country that labor is scarce, especially on the farms. For that reason I should like to express my opinion and give my experience of several years in the Maryland State Bureau of Immigration.

It is a well-known fact that at present most of the immigrants that land in New York and other ports, including Baltimore, go to the Northwestern States and Canada, where they are wanted and needed just as much as they are in the South. Only because the South does not get so many, it appears to need them more. During the past few years, however, the attention of European immigrants has been called to the South. The State bureaus of Maryland and the Carolinas, as well as the railroad companies of the Southern States, have spent a great deal of money and energy in bringing the advantages of that fine section before the people in Europe, and in consequence thereof many very desirable immigrants have made their homes in Maryland and the other Southern States. Naturally, when they like the surroundings a great many others, both relatives and friends, follow without further efforts on the part of the State bureaus or railroads. However, there will always be new fields opening in every section where immigrants will be wanted, and in order to keep pace with the Northwest, and especially with Canada, where the Government offers extraordinary inducements, it is necessary to continue the work.

Few people realize how difficult it is to induce the intelligent class of laborers to come to the United States under the present immigration law. That section of it which applies to contract labor is very unreasonable. It frequently happens that a farmer who immigrated to this country and has become an American citizen receives a letter in which a younger brother or a friend expresses a desire to come to America. The former, who, like all agriculturists, is badly in need of help, as well as rejoiced at the prospect of seeing his brother or friend again, writes back that he should come.

The difficulties for the immigrant begin while he is still on the steamer, where he is taken before the ship's surgeon to be sure that everything is all right. Then he must be examined again at the quarantine station before the vessel is permitted to enter the harbor. Upon landing everybody has to submit again to a rigid examination that the officials may be sure that he is not suffering from any eye or skin disease and is in all respects healthy.

All this is perfectly proper, and I would not have any of these examinations abolished. I mention them merely to show that almost everybody must get nervous in undergoing such an ordeal. Moreover, you will understand that the immigrants do not receive the same consideration from the various physicians that you are shown when you visit your family doctor, who knows that he will get a good fee from you.

Next the immigrant comes before the immigration inspector, who asks him about 20 questions. After he has gone through the examination described above, is it surprising if at last he makes a mistake? Depressed as he is, when asked whether he has been promised work by some one previous to his leaving Europe, he will probably grasp at this opportunity to show that he is not without a friend in this country and answer "yes." He does not know that this is in violation of the contract labor law, but unless some influential party takes his case to Washington on an appeal to the Secretary of Commerce and Labor, the immigration officials, who are there simply to carry out the law to the letter, must have him deported.

Such cases are naturally used for all they are worth by all European newspaper editors, who are opposed to emigration because it causes them to lose many subscribers, and the best emigrants will decidé not to come to the United States.

The people of the Teutonic race are considered the most desirable immigrants. Now let us see how many there are of that race in Europe to draw from. Norway has 2,250,000 inhabitants; Sweden, 5,250,000; Denmark, 2,500,000; Holland, 5,500,000; Belgium, 7,000,000; Germany, 56,000,000; Germans in Austria, 12,000,000; in Switzerland, 2,500,000; in Russia, 2,500,000, and England has 30,000,000 inhabitants.

During the past fiscal year, of the 73,000,000 Germans, only 82,360 came to America, or about 11 out of every 10,000. Of the 30,000,000 English, 50,865 emigrated to this country, which makes about 16 out of each 10,000. From Holland and Belgium only 7 out of every 10,000 came. The Scandinavian countries—Denmark, Sweden and Norway—furnished 62 immigrants out of every 10,000 of their population. But I doubt that any number of this nationality would permanently stay in the South, as they find the Northwestern climate and the social conditions in that section more congenial.

Now I would say that, besides the Teutonic race, the Poles, Bohemians, Slovaks, Croatians and Slovenians, who immigrate now in large numbers, are also a very desirable class of people, especially for the South, as they come from the Austrian empire, where it is much warmer than in Northern Europe. Many of these people, however, are not so well educated as the Germans, for instance, where there is only one illiterate in a thousand inhabitants. But we have the brains here all right. What we want is people who can and are willing to do the common work, and I am sure that the children of the immigrants will take advantage of our free public-school system and learn all that they can. These are the kind that would become good law-abiding citizens and help to develop the almost inexhaustible resources of our Southern States. Also we ought to receive more immigrants from Germany, for, in spite of the fact that a large number of them have emigrated every year, Germany's population has increased at the rate of nearly 1,000,000 per annum. The upper and middle classes live very comfortably, but for a poor laborer the expenses are so high that he needs all that he earns to provide the most necessary food and clothing for himself and his family. Daily I receive letters from people in all parts of Germany and Austria stating that they are compelled to work from 12 to 18 hours day after day, with no other satisfaction at the end of each year than that they have merely existed and grown 365 days older. The enormously high taxes caused by the maintenance of the standing armies and the debauchery of the nobility make it impossible for the ordinary man to save anything, and he and his family, after a hard day's work, often have to go to bed hungry.

All these people have heard of America as the land of liberty and equality, where everybody has an opportunity to work himself up. Many of them would love to come here and would endure all kinds of hardships just for the sake of their children, that they might have a better opportunity in life than the Old Country promises. But our law prevents them from coming here. Can you expect that a man with a family will give up his position, no matter how badly paid, and go to a strange country on an uncertainty? No! But if I were permitted by our law to offer each a steady position I could obtain enough desirable immigrants to accommodate every farmer in America.

The labor unions in this country control between 2,000,000 and 3,000,000 votes, and, because they are so well organized, succeed in getting almost anything for which they ask from Congress. The farmers of this country certainly number more than 3,000,000. Why cannot they pull together once, at least, and see that a little bit of legislation is passed for their benefit?

My proposition is that it should be made lawful to bring in farm laborers under contract. The labor leaders will say that then everybody would come as a farm laborer, but that after a few days he would be found in some factory or mine. Such a thing could, I believe, easily be prevented. Suppose that the law were so framed that an immigrant brought in as a farm laborer must be deported if he should accept a position other than as a farm hand within a year or perhaps two years from the time of entering this country.

To all those who are not, or think that they are not, directly benefited by any desirable immigration I would say this: If every immigrant should bring on an average only $10 to this country, that would mean an annual increase of our national wealth of at least $10,000,000. Every immigrant who comes here will need about three pairs of shoes, one suit of clothes, two hats and a great deal of other wearing apparel each year. Our large manufacturers are all prepared to sell these goods and make preparations for the demand of an increased population each year; but think of the great calamity in business if immigration should practically cease, and as a result there should be an overproduction of 3,000,000 pairs of shoes, 2,000,000 hats and 1,000,000 or more suits of clothes. I am sure that many factories would have to close, for a while at least, and if the deficit could not be made up otherwise, many mechanics would lose their positions permanently.

Another very important point is that all immigrants become producers from the moment they are employed. They are the ones who do the hardest work everywhere. The native American is always after a job which pays the most money and requires the least work. If possible he gets an education and becomes a professional man, others take positions as clerks or choose a similar occupation, and those who are not able to fill any other easy positions try to get some little job in politics or become street-car conductors rather than to stay home and work on their father's farm. A native American is rarely seen doing hard manual labor, but just stop immigration and the result will be that everybody will have to do his own work.

THE SOUTHERN FARM HOME.

By PROF. ANDREW M. SOULE,
Dean of the College of Agriculture, Virginia Polytechnic Institute.

[Written for the Manufacturers' Record.]

The farm home bears the same relation to the agricultural interest of our country as the keystone does to the arch. It is the central, as it were, interlocking figure; the instrument which, properly played upon, affects all the conditions of farm life, favorably or unfavorably. It is the source from which intelligent effort, happiness and success all emanate. Should it therefore not receive the greatest measure of attention from institute workers? What greater work can be accomplished for the cause of agriculture than the permanent betterment of the farm home, the embellishment of its grounds with attractive flowers and inviting shade trees, the beautification of its exterior and the rearrangement of its interior so as to make the duties of the housewife and mother a pleasure instead of a drudgery?

The farm home is frequently characterized by untidiness, both as to its interior and exterior. Piles of trash are left here and there and create an unsightly condition of affairs. Flower beds are frequently an unknown quantity. Too often there are no trees to provide a windbreak from the winter blasts or serve as a cool retreat in the heated days of summer. Paint is often a stranger, and inconveniences are too numerous to mention. Broken-down fences, live-stock grazing on the front lawn or the entire absence of grass do not inspire one with a feeling that the home is that center of comfort and inspiration it should be on the farm as elsewhere. The humble little cottage of the mechanic in the city frequently presents a far greater attraction to the eye of the passerby than the home of the comparatively opulent farmer on his 500 or 1000 acres of land, which he will tell you with commendable pride are unencumbered and as productive land as God ever blessed with His cheerful and life-giving sunshine.

Why should this condition exist? Why should not as much attention be given to the esthetic side of life in the country as in the city? Simply because this feature of rural life has been overlooked. It is just as essential and just as necessary to teach people to tidy up as it is to teach them that two and two are four. Cleaning up is a science, little as we have thought of it in that light, but it is a great and vital science affecting the life of the individual as materially as many things which we regard as more essential.

A great deal of the time and attention of the rural school is given to teaching the child things that are not as essential and would not have such a marked influence on his future as the science of cleanliness and learning to be tidy and systematic: learning to have a due appreciation of the esthetic side of life. In traveling through the country have you never been impressed with this fact; have you never noticed that once in a while during a long day's drive through the rural districts there stands out this strikingly attractive home, this ideal condition to which I am endeavoring to draw your attention? Have you ever rested in a home of the kind to which I refer? If so, you have been impressed not only with the chasteness of the exterior, but with the loveliness of the interior as well. And you can understand and appreciate why this farmer and his wife and the little ones love the country and cling to it and feel that in their humble home they have all that is good and beautiful and worth striving for in life.

It can be said of us as a nation, and as farmers as well, that we have been industrious beyond measure; that we have garnered from the earth lavish stores; that we have builded great cities and tremendous industrial enterprises; but as a nation are we not sadly lacking in the esthetic things of life, the things that make the peasant homes of Europe so intensely

attractive to their occupants, that give them such a love of country and of their native heath that they can scarcely be driven from it by the most bitter adversity? When these things come about, will not a part of the great problem now agitating America be solved, namely, that of keeping a just proportion of our people in the rural districts in order that the raw materials needed by our immense industrial concerns may be provided in sufficient quantity to keep the equilibrium between supply and demand properly adjusted?

The subject assigned me is so profound that it is difficult to know from what standpoint to approach it. Its magnitude makes the task discouraging; hence it would only be possible to give a brief resume of some things that might be accomplished for the permanent improvement of the farm home, so as to make it a delightful place in which to reside. One of the chief objections at present is its isolation. At a date when the country was sparsely settled and roads as public highways were still unknown, homes were located without regard to social considerations or convenience to market, church or school. Care should be given to selecting a site that will bring the farm in close contact with the public highway, so as to make the home accessible to neighboring farm homes. If several neighbors would build on the abutting corners of their respective properties, the community life could then be developed to a material degree not known at the present time. At the present time, with our knowledge of sanitary science, we believe that the farm home should be located on high ground, where it will command a view of the plantation. It is just as easy to locate the farm home so that inviting vistas can be obtained from its porches as to put it down in some obscure place where it cannot be seen and where it can only be approached with difficulty.

The time has passed in many communities when the springs should be exclusively depended on for water. If it is pure and wholesome, there is certainly no objection to using spring water. In the warmer sections of the South ice would frequnetly be a question of serious consideration to the farmer; hence the value of a good spring. All too frequently, however, springs are contaminated now by the germs of typhoid fever and other death-dealing bacteria that find their way into the underground waters from sources unknown to the owner. Driven wells, drawing their water from deep down in the earth and incased in iron pipes, would insure a more healthful water supply and one that can be depended upon. The well can also be located conveniently to the house, even under it, and thus save enough of the energy of the housewife in 12 months to add years to her life. It is neither desirable nor just to expect the women of the household to carry water long distances from springs when a driven well can be put down at a cost of a couple of hundred dollars and solve the question by bringing it into the kitchen. Then, by the use of windmills, force pumps or a gasoline engine, the water may be driven into a tank placed on a platform of suitable height outside, or in the attic or basement, and a supply of water for the bathroom and the kitchen sink rendered available at all times. A spring may be used as the source of supply by installing a hydraulic ram at a cost of $25 to $100, depending on many local conditions which cannot be enumerated here. A windmill with all accessories, including the bathroom fittings and necessary plumbing that will furnish an ideal supply of water, can be installed at a cost of $250 to $350.

The character of the buildings found on the average farm is not what it should be. In some cases there is sufficient excuse for their condition, possibly due to the impoverishment of the farmer or to the fact that they were built long ago, and owing to the high price of material and the scarcity of labor, the farmer has not had the heart to undertake their repair and rearrangement. In the far South very modest buildings will meet all the requirements of the average farm. On the cotton farm comparatively little is needed save a suitable shelter for the mules and the farming implements. A mere shed with suitable divisions for pens and with board or concrete floors will provide desirable shelter for swine, which, owing to the mildness of the climate, can gather their food in the fields practically all the year around.

On the tobacco farm the principal buildings required would be suitable barns for the cutting and storing. These can, as a rule, be constructed by the farmer himself with the aid of local carpenters.

On the dairy farm more elaborate buildings will be necessary. They should be constructed so that sunlight will reach every part of the building and the windows should be large and numerous so as to insure ease of ventilation. In dairy barns where cattle will be kept in more or less during cold weather, the floor should be of cement and the stanchions of iron. It is true that wooden mangers and floors can be used, but they are certainly unsatisfactory, and in our experience we have found that cement floors are more economical than wooden ones, even when the best grade of oak is used.

The farm buildings should be constructed of planed lumber, at least on the outside, so they can be painted. Many cheap forms of paint can be obtained that last very well. Some object to red, but it furnishes a cheap covering material which adds greatly to the attractiveness of the buildings and preserves the lumber as well. Cold-water paint, leaving the buildings a dead white, can now be obtained cheaply. We have had occasion to use it a number of times, and have found it quite durable and reasonable in cost. With a spraying machine the stable can be painted inside and out, thus keeping them in a sanitary condition at a low cost.

On stock farms the buildings will need to be of a more elaborate character, though it is not necessary to have closed-in barns east of the Mississippi or south of the Ohio river; in fact, better results, judging from our experimental investigations with beef and dairy cattle and sheep and swine, will always follow the use of barns open at least toward the south, even as far north as Virginia, and at the high elevations prevailing in the Appalachian region. In the more elevated sections of country, and where the rainfall is persistent, barns will need to be constructed so as to permit of storage. This is best obtained by using barns with saddle roofs, following the plank frame construction, as this economizes lumber very materially and gives a barn more convenience in every way than where the old methods of building are followed.

The demand for information relative to farm buildings has been so great at the Virginia Experiment Station that we have endeavored to meet the situation by having blueprints of the various buildings in use on our college and station grounds made for distribution to residents of the State at the actual cost of making the prints. This has enabled many farmers to get working plans of the silo and many other farm buildings and have them constructed through the aid of local carpenters. Modern, convenient and properly arranged buildings are a part of the working capital of every farmer, and the farmer can afford to sink some money in making this part of his equipment what it should be. The endeavor to farm without suitable buildings has, so far as the writer's observation goes, been a dismal failure, and is one reason why so many farmers have the yoke which a mortgage fixes so firmly around the neck to carry for an indefinite number of years.

But more important even than the farm buildings and more essential to the well-being of the family is the necessity of a comfortable farmhouse. And this question of houses affects the labor problem as vitally as any other. We have constructed at the Virginia Experiment Station small weather-boarded cottages with plenty of light and good ventilation, with cement foundations and four good rooms, at a cost of $250 to $300. We have found up to the present time that men can be kept in these houses at a lower wage scale than that prevailing in the vicinity of the college farm, simply because these little cottages are warm, dry and comfortable, and superior to those found on the average farm. The provision of plain and substantial houses for the workingmen will do much to solve the labor problem which is now agitating the farmers from one end of the country to the other.

As to the style of the farmhouse, that cannot be discussed in detail within the limits of a paper of this kind. From the small cottage to the two-story house bordering on the mansion of colonial days, convenience of arrangement and good ventilation should be the first essentials to consider. The porch, especially in the South, is the most important room in the house. In cold climates it can be enclosed in glass during the winter months and made into a sun parlor, furnishing attractions which cannot adequately be appreciated by one who has never been snowbound in a Northern home during the winter for weeks at a time. The farmhouse may cost anywhere from $500 to $5000, according to its extent and elaborateness of finish.

A substantial cellar should be built under every house, concrete being the material to use, as it is the cheapest and most durable. The house may be built of wood, brick, stone or concrete blocks. Cement or wood-fiber plaster should be used for the walls, and pine or oak, if properly selected, will make a very satisfactory finishing material. Every farmhouse, except in the Gulf States, should have a furnace, so it can be uniformly heated. A hot-air furnace can be installed at a cost of $250 to $300, depending on the make and size. A steam-heating plant under the same conditions will cost from $350 to $400, according to our experience at the college. For the sake of attractiveness and cheer, a large fireplace may be constructed in the living room, where either wood or coal may be used. An ashpit should be built under the fireplace, so as to keep the dirt out of the upper part of the house. Water should be carried through the house, as already indicated, and light may be provided through the use of acetylene gas, which furnishes a most desirable light, and there is no danger from the use of this gas if a properly-constructed machine is bought and the farmer will operate it himself, and not leave it to the care of ignorant and indifferent servants.

Then, with the telephone connections and the advent of good roads and circulating libraries, what pleasures and comforts are denied the farmer's home? None that we can see, but unfortunately the essential things just enumerated are wofully lacking on the average farm. It is true that poverty may explain the cause sometimes, but there are thousands upon thousands of farms where the owners are amply able to provide all these conveniences and luxuries for the home, and yet they are lacking simply because the farmer has not been educated along these lines; simply because this question of home improvement has not been agitated as it should have been; simply because the farmer does not realize what these comforts and privileges mean to his family, what enjoyment it would bring to the housewife, what attractiveness it would lend to the home, and how firmly it would bind the boys to the pursuit of farming and to the love of rural life. What a delight the farm kitchen would be with a modern range, a hot-water heater and porcelain or soapstone wash sinks and drainage provided for carrying away the waste water. And why, pray you, should not the comparatively opulent farmer provide these conveniences, nay these necessities, for his wife? Are they not as necessary as fine buildings for the live-stock?

As to the disposition of waste from the wash sinks and lavatories, opinions differ. The septic-tank system for the disposal of sewage has many warm advocates, and there are certainly many conditions under which it can be successfully installed. If a cesspool is properly constructed and contains four feet of liquid, a tenacious skum four to six inches in depth will form on top, which is just what takes place in the septic tank. There is no good reason, therefore, why a cesspool should not be provided on every farm and prove the solution of what has been an apparently unsolvable problem in the past. While the dry earth closet has its advocates, as ordinarily care for it is likely to prove a breeding-ground for disease, and is just as likely to be objectionable and pernicious as a cesspool. Much of the trouble experienced with cesspools is due to their improper construction rather than to the system itself. These pools should, of course, be built to some distance from the well and on sloping ground that will carry the drainage from the house; otherwise, there is no particular danger. Disinfectants should not, as a rule, be used in the cesspool, as it is now conceded that many forms of harmful bacteria are destroyed by other forms which develop in the cesspool. Trouble has frequently come from cesspools because they were not kept covered so as to prevent mosquitoes breeding therein. I am credibly informed by those who have had considerable experience that a cesspool need not cost much money, and that one six to seven feet wide and seven feet in depth will take care of the waste material from a good-sized farmhouse. Any handy farmer can construct one for himself at a cost of from $15 to $40.

The lawn immediately in front of the house should not be crowded with trees and shrubs, but left in a green sward. Attractive drives and walks should be laid out where necessary, the weeds should be kept in check and the grass mowed from time to time, if not by hand, at least by horse-power. With painted fences and care of the walkways and with the addition of flowers and the grateful shade which stately maple, oak, beech and hickory trees will provide, an attractiveness is added to the setting of the farm which cannot be properly pictured in words. An extended list of the flowers that might be used satisfactorily would occupy too much space, but sweet peas, nasturtiums, scarlet sage, hollyhocks, chrysanthemums, dahlias, asters, phlox, verbenas, etc., can all be grown with so little effort that they should be a part of the collection on every farm. Then roses grow so abundantly and in such variety that they should be trained up on the porches, especially the ramblers, of which there are several distinct varieties. The following shrubs are all handy and easy to take care of: Japonica, snowball, lilac, hydrangea, wigelia, syringa, honeysuckle, etc.

In conclusion, the responsibility of the farmers' institute for the present condition of farm homes is very great, in my judgment. I have endeavored to portray the far-reaching influence of the farm home on the welfare of the farmer and the community, and also its relation to the preservation in the minds of the boys and girls of a love of the country. We are suffering today from a neglect of rural industries, from the crowding of people into towns and cities because they cannot enjoy the conveniences, the society, the gayety and frivolity which too often characterize city life. The hum and buzz of a big city do not give happiness to any. There is something better and nobler in the human mind which requires satisfaction, and which will most often be found where persons have come intimately in contact with nature and learned to appreciate the God-given beauties of the landscape and of the trees and flowers and the growing crops of the field and the variety of life found on the average farm. But there can be no real, permanent pleasure and satisfaction in country life so long as the farm home is a neglected institution, its buildings unpainted and unsightly, the yard overgrown with weeds and trash and the house itself a ramshackle affair lacking in all modern conveniences. As already indicated, there is sufficient wealth at the disposal of thousands of farmers to remedy these unsightly conditions. Desirable, yea necessary, changes will not be brought about suddenly, but gradually and surely by the education of the people in the science of being tidy and systematic and of appreciating the esthetic side of life and the joy and happiness which certainly flow from it. These conditions, so essential to the permanent welfare of our farm homes, we must strive for earnestly and with unity of purpose. The farmers' institute, through its ability to reach thousands of people annually and make permanent impressions on their receptive minds, must lead the vanguard in this fight for the rejuvenation of the farm home.

Blacksburg, Va.

BLOW AT REAL EDUCATION.

Proposed Increase of 408 Per Cent. in Second-Class Postal Rate.

[From *Ideal Power.*]

Present rate, one cent per pound.

Proposed rate, four cents per pound.

This question is of vital importance to the public, and, from what we have noted, seems to have received scarcely a single thought. To *Ideal Power* it means nothing from a selfish standpoint, hence we speak without personal motives.

Owing to the continued annual deficit in the postal department, requiring a special appropriation to cover same, the idea has become prevalent that the deficit is caused by the low second-class rates now charged for handling newspapers and periodicals. It is quite an easy matter to have one's imagination harness up an idea only to have it run away with him with the bit in its teeth. Therefore, *Ideal Power* should be pleased to have its 15,000 readers consider the subject, and, if they can conscientiously agree with us, immediately write their respective Congressmen at Washington, asking that other means be resorted to than that which we understand is contemplated.

This subject is to come up within the next few weeks, and anyone interested should act promptly. 'Tis better to have the deficit than to avoid it by the remedy proposed, which will work a hardship upon the public at large by causing a condition which will necessitate the increasing of subscription rates of newspapers and periodicals. The newspapers claim (and the true conditions warrant it) that they are entitled to a lower rate than periodicals, for the reason the average haul in their case is approximately 300 miles, and on periodicals 800 miles; yet all publications of an educational nature are, in our opinion, entitled to the same rate without discrimination. There are a number of our leading publications with large circulations which the increase would force to expend from $20,000 to $40,000 annually in excess of their present outlay; the publishers could not be expected to bear the burden, hence the public would be forced to shoulder it through increasing advertising and subscription rates.

THE REAL CAUSE OF THE DEFICIT.

Every patriotic citizen desires that governmental affairs be managed along a strictly economical commercial basis, that a deficit might be eliminated from all departments, but in correcting such irregularities the prime cause should receive first attention, and in all probability there would be no necessity for touching upon secondary causes therefor, and the remedy we have in mind is simple and ought to be reasonably effective.

The franking privilege, in our opinion, is the worst evil which has permeated our postal laws, the repealing of which would give quick and permanent relief without in any way retarding the education of our people or our commercial progress, while on the other hand the curtailment in circulation of our engineering and industrial publications would hamper our engineering and commercial students, which would prove nothing less than a commercial calamity.

We have no desire to suggest anything to our 15,000 readers that will inconvenience our Congressmen, Senators or other public officials, or cause them to suffer any pecuniary losses through the abolishing of the franking privilege, yet the proper department should bear its legitimate expense. Our lawmakers possibly are underpaid, yet there is no plausible reason why, as a partial atonement for our shortcomings in this direction, privileges should be granted creating an erroneous impression with reference to the postal or any other specific department. Why not handle this matter as it would be handled by any private corporation or stock company, by charging the amount to sundry expense and make an annual appropriation to cover the amount and issue franking stamps, and thus determine where the abuse of the franking privilege rests, without requiring the public at large to suffer for that for which they are in no wise responsible?

In Prussia the Government paid a certain amount to the Imperial Postoffice Department (Reichspost) for a franking privilege. The Postoffice Department claimed the amount paid was not sufficient to reimburse it for this privilege, and in order to prove its assertion it issued special stamps of all denominations for the use of the various official departments in Prussia.

These stamps were used only for one year, viz., from January 1 to December 31, 1903, inclusive, and were used as a check upon the Prussian Government in order to ascertain how much postage at regular rates it consumed during that period. Of course, the franking privilege was suspended during that year.

We are of the opinion that all engineering and technical publications are of a highly educational character, and that our rapid commercial growth is largely due to the fact that there are many of these publications having correspondents throughout the civilized world whose duties primarily are to report on all industrial conditions, contracts to be awarded, contracts let, new work contemplated, etc.; thus one is constantly in touch with the world's progress, and millions of dollars' worth of business are secured annually through such advance information. Therefore, it is to be hoped nothing shall be done to interfere with this service.

The engineering student when leaving college and engaging in an active career along the line of his chosen profession feels the need of wise counsel with the experienced engineer. Text-books are digested from cover to cover, in many cases without finding that which is required. The world is moving so rapidly that by the time a new text-book is compiled and printed new problems to be solved have presented themselves, and these new conditions must be met. The American engineer does not know what it is to fail in his undertakings. His success is in many cases traceable to the fact that through his subscription to our leading engineering publications covering his chosen field he is being kept in touch with the brightest minds throughout the civilized world. New and novel engineering feats are accomplished almost daily. The leading publications employ able exponents of the art to write up all work of importance, and go to the expense of illustrating each article by half-tones from photographic reproductions and line drawings in detail as the conditions require, and our students in every class being quick to grasp the situation and to adapt themselves to the needs of the hour, have succeeded in forcing America to lead the world. Therefore, anything which may be done to hamper our education will prove a commercial calamity.

We are largely of imaginative minds, and through our imagination we conceive ideas that are later made to create mechanical devices that revolutionize methods of accomplishing given results. An inventive genius will pick up one of our many valuable publications, and, while reading of some process of manufacture, conceives an idea whereby the same work may be accomplished more rapidly and accurately with a saving in time and labor expended. Therefore, our record in producing fine machine tools, and by the aid of which we are able to compete in the world's markets, primarily, no doubt, could in many instances be traced to the sowing of the seed in some imaginative mind by our periodicals. Something new is accomplished today at a given point, and a month hence is known throughout civilization.

Therefore, the time to act is now, and all our readers should write their respective representatives at once and express their wishes clearly and forcibly on the subject and prevent the forcing upon us of commercial suicide.

Purification of Sewage.

A valuable contribution to the literature on the disposal and purification of sewage has just been issued by the United States Geological Survey as Water Supply and Irrigation Paper No. 185—investigations on the purification of Boston sewage with a history of the sewage-disposal problem, by C. E. A. Winslow and E. B. Phelps. The volume of sewage discharged by modern communities is so large and the character of all kinds of sewage is always so objectionable that the so-called sewage-disposal problem becomes, from the economic as well as the sanitary point of view, one of the most serious with which American cities have to deal. It is of vital importance to every community to secure such a disposal of obnoxious sewage as will avoid the creation of any insanitary focus or foci in the environment, or any infringement of the laws of hygiene and sanitation. The investigations described in this publication were made at the sanitary research laboratory and sewage experiment station of the Massachusetts Institute of Technology under the direction of Prof. William T. Sedgwick.

HILL COUNTY INVITES.

Everybody Busy and Prosperous in This Texas Community.

Mr. Will T. Renfro, superintendent of the city water-works, Hillsboro, Texas, writes to the MANUFACTURERS' RECORD as follows:

"This section of the country is in a flourishing condition in every line of business. Crops of all kinds were fine and prices high, and the farmers are better fixed than they have been in a long time. Although the price of land is from $50 to $100 per acre, the renter is buying and paying for it out of crop returns. The oil mills and compresses are in full blast. Cottonseed were so plentiful that hundreds of tons had to be piled up on the ground without shelter. This place has received over 20,000 bales of cotton by wagon, and the total yield for the county of Hill is estimated at 110,000 bales. Our cotton mill is running on contracts sold six to eight months ahead, and is reaping a good profit. Our roller mills are running all the time, and the demand for the product is equal to the output. There are lots of room for all classes of business in this country."

More Coal Used in South.

We think that interest will attach to the article upon the development of Southern coal sales which appears in another column. There has never been any question in recent years as to the coal resources of the South. Ever since the early development of that section the vast tonnage of coal in the ground has been recognized. But many of the mining undertakings have been unsuccessful because of the distance from market. The West Virginia people early established a coal trade with New England and the North—later with the Western States—but the operators in many other sections found that there was really but little need for the tonnage they could turn out, the local requirements being small back in the seventies and eighties, and if they went many miles from home they would run into the territory of some other producer. In the last 10 or 15 years there has been an encouraging growth in coal requirements in the Southern States, not only for railroad and manufacturing purposes, but for domestic use, wood gradually going more and more out of use in the larger centers of population. And, of course, there has been some development of office buildings, hotels and apartment-houses in the larger Southern cities, as well as an increase in large buildings of other types, where the use of wood, once so general in the Southern States, would be quite out of the question. Altogether, it would seem that the development of the home coal trade in the South has been one of the notable features of the past 10 years.—*Coal Trade Journal.*

For Spinners and Growers to Meet.

President James R. MacColl of the National Association of Cotton Manufacturers has written to the presidents of the Southern Cotton Association, the Farmers' Educational and Co-operative Union, the National Ginners' Association, the American Cotton Manufacturers' Association, the National Association of Manufacturers and the International Federation of Master Cotton Spinners and Manufacturers' Association suggesting the desirability of repeating in October next in some Southern city like Atlanta the conference of cotton-growers and manufacturers which was held last May at Washington. He believes that the meeting-place will be convenient for a large number of growers, and that time will give manufacturers an

opportunity to be in the neighborhood of the cotton fields at the period when picking, ginning and baling are still under way. The associations of cotton-growers have cordially approved of the suggestion, and it is understood that similar action has been taken by the International Federation.

ALERT FOR NEWPORT NEWS.

Mayor Buxton's Review of Its Ten Years' Development.

In a letter to the MANUFACTURERS' RECORD Hon. Samuel R. Buxton of Newport News, Va., writes:

"The South was never so prosperous as today, and its present prosperity, I am persuaded, is but an earnest of what we may confidently expect tomorrow. As much as this section can boast of more than it might have is in large part due to the intelligent exploitation of the South's resources through the columns of the MANUFACTURERS' RECORD. There is, in my humble opinion, no single factor working for the development of the South so potent as the periodical whose policy you have the honor to direct.

"Newport News, in the development of her own resources and by lending somewhat to the industrial and educational advancement of the State at large, is endeavoring to place the Old Dominion in the front rank of American Commonwealths and to restore to the South the prestige of which she could at one time boast.

"Nineteen hundred and six marks the tenth anniversary of the incorporation of Newport News. In submitting my annual message to the City Council a few weeks ago I incorporated a resume of the growth of the city since its incorporation, and, knowing the interest which you feel in the growth of this section, I am taking the liberty of enclosing you herewith a copy of this message, that you may know more fully the progress which we have made as a municipality.

"If at any time I may be of service to you in giving a report concerning the industrial or commercial growth of this section, I trust you will command me. I shall be glad to be of assistance in exploiting the resources of this community and in showing the advantages which this section of Virginia has to offer to the home-seeker and the investor of capital."

In his message Mayor Buxton said:

"The population of the city in 1890 was 4449; in 1900, 19,635; in 1901, 21,154; in 1902, 22,673; in 1903, 24,192; in 1906, 28,749—an increase of 342 per cent. from 1890 to 1900. The increase from 1900 to 1906 has been marked, as shown by the above figures. This growth is especially noteworthy when it is recalled that the sections contiguous to the city have enjoyed a similar development. According to the United States Census Bureau, the capital invested in Newport News in manufacturing industries for 1900 and 1905, respectively, was $14,750,874 and $22,958,343, or an increase of 55.6 per cent. The average number of wage-earners for the two years given was 5285 and 7406, respectively, or an increase of 40.1 per cent. The wages paid in 1900 amounted to $2,389,729, and in 1906 to $3,435,667, or an increase of 48.8 per cent. The value of products in 1900 was $5,937,820, and in 1906 it was $9,053,906, or an increase of 52.5 per cent."

He showed that between 1896 and 1906 the export values had increased from $14,847,746 to $20,116,682, and, referring to improvements, said:

"The permanent taxable improvements on real estate have been added to each year. The city is to be congratulated upon the character of the buildings which are now being erected. The taxable value of these improvements in 1896 was $1,687,443; in 1900 it was $3,363,778; in 1903 it was $4,690,895; in 1906 it amounts to $4,820,775.

"In adidtion to the taxable values just mentioned, the city has been greatly benefited and beautified by the erection of the improvements upon which no taxes are collectible. The United States Government has recently erected a postoffice and custom-house building at a cost of $250,000, which from an architectural standpoint and in matter of convenience is second to none in Virginia. Many of the leading denominations in the city have built handsome and costly houses of worship. In 1896 $1,687,443 represented practically all the improvements in the city. The non-taxable values were so small as hardly to be considered. Since that time the non-taxable values alone have increased, at a conservative estimate, $600,000. The bonded indebtedness of the city amounts to $611,000. This amount is smaller than for any other city in Virginia of the class of Newport News. The greater portion of the revenue derived from the sale of these bonds was expended in the erection of the public schools, the establishment of the present sewer system, building the bridges across the Chesapeake & Ohio Railway and in paving the streets of the city. Of the streets of the city, 5.3 miles are paved. The value of the principal salable possessions of the city aggregates about $225,000."

He urged adequate provision for the future attractions of the city, and said:

"The time has come when Newport News should adopt a definite and comprehensive plan of civic improvement. The practical necessities of the present must be provided for, of course, but we should not fail to look fairly into the future and adopt such a policy today as will make for us a beautiful city tomorrow. We have builded well from a material point of view, but there is no denying the fact that we have neglected opportunities to improve the city from an esthetic point of view.

"City building and city development has today become a science. Practically every city in the country is engaged in this work, and we must keep pace with the most progressive. Thousands of visitors will come to us during the Jamestown Exposition from cities which have accomplished results in this line of work. We cannot afford to neglect to make our city as attractive as possible.

"A civic improvement association has been organized during the year. Its aim is to better and beautify the city. Its membership embraces some of the most representative and progressive of our citizens. I should suggest that the city co-operate with this association in its efforts for improvement, and to this end, if necessary, that a standing committee on civic improvement be appointed."

To Drain Fertile Lands.

A dispatch from Baton Rouge, La., says:

"M. P. Robertson, the local member of the State Board of Engineers, left today to begin a preliminary survey of the canal to be built by the White Bayou Drainage District. The new canal is to begin near Zachary and run in a southeasterly direction a distance of about 11 miles. One year's special tax has already been collected for the purpose of beginning the work, which, when completed, will open up for cultivation thousands of acres of the most fertile farming lands in this section of the State. At a recent meeting of the Board of Commissioners of the new district there developed a tendency on the part of the members favoring the drainage of the surplus waters into the Mississippi, while the natural drainage is inclined toward the southeast and finally into Bayou Maurepas. The preliminary survey of the proposed line will probably determine whether or not drainage into the Mississippi will be practical."

The Greatest Loss.

[*Mining and Scientific Press* of San Francisco.]

We have dwelt upon many features of the earthquake-fire that turned the sympathies of the world toward San Francisco in April. There remains one lesson, and the chiefest of all, which we have reserved for special consideration. We refer to the loss of information in notes and manuscripts belonging to our engineer friends that, being written on perishable paper, without a duplicate, were consumed irretrievably in the flames. One family of engineers, a father and two sons possessing a large stock of data gathered during two generations of intelligent activity, lost every scrap of the knowledge that they had expected to perpetuate in writing for their own use and for other members of the family. Two engineers who were specialists in dredging and placer mining, possessed of a fine collection of drawings of machinery and records of practice, lost all these. Such instances could be multiplied, but it is not necessary; it requires but little imagination to appreciate the tremendous amount of individual knowledge in written form that perished utterly during the catastrophe. It was individual, and that is why it exists no longer. Had it been given to the profession in the form of literary contributions to technical societies or to professional periodicals, it would be available today for the benefit of the world at large and incidentally for the use of the men who hugged it closely to themselves. There is no waste so complete as the waste of experience; there is no gift more useful than the record of professional practice. There are men who, from mere laziness, postpone the act of systematizing the data they have collected and the publication of them in such form as will render the information of service to others; for these men one has sympathy, for to be lazy, especially after hard routine work, is human enough. But what shall be said of him who, collecting the little special knowledge that every man can accumulate after a few years of work, prefers deliberately to put it away in a safe, so that the exclusive benefit, if any, of it may be his, and his alone; he makes up his mind that no competitor shall have it, and as for the rest of the world, such as students and the younger fellows whom it might help, why should he give it away to them for nothing? So the greedy tongues of flame sweep through his office and shrivel the selfish manuscript to a cinder. Shall we be sorry for such a man? Yes, but not for his loss of data so much as for the narrow spirit that chooses to live and work to itself.

Sentiment aside, a big fire proves the danger of omitting to duplicate valuable manuscript or even notes and drawings, and of all the ways of multiplying the record, none is so simple as that of putting it into print. Some of us lost the notes of 20 years, but when we realized it there came the pleasant reminder that the best of it had been already put together in the form of material published in transactions and books, of which there were so many copies and so scattered that no single disaster could destroy them all. Whether they were of small or large value mattered little, they were ours, the children of our brain, and they lived, to be a part, however unimportant, of the general reference library of the profession. But we can meet the least altruistic engineer on his own ground, for we venture to say that he who never goes beyond the notebook stage or the individual record of work that is prepared for personal use will never go far and rarely possess as much as he would if he took the next step, namely, that sifting of data and refining of judgment which are required for the act of publication. Any man who has ever started to put together his information on a particular subject need not to be reminded how soon he found it was like a garment only half woven, full of holes and unready for use. No one learns as much from his writing as the author; it is an education that continues throughout life, and it is the one that best brings home the limitation of human attainment. So, gentlemen of the profession, put the best that you have into print, for fear of otherwise losing it, and with a purpose generous as the inheritance of knowledge that has come to you without money and without price.

LOOKING TO THE FUTURE.

Facts to Be Considered in City Extension.

An interesting interview was published in a recent issue of the Charlotte (N. C.) *Chronicle* with Mr. D. A. Tompkins concerning the modern methods to be adopted in laying out the proposed extension of the city limits of Charlotte. He said: "In considering the extension of the city limits it should be kept in mind that a well-designed and well-constructed city needs to be laid out in the same way as a well-designed and well-constructed house. In order to make such a city it is important to take in enough territory to lay out now a city to accommodate at least 100,000 people. I would favor the employment of a corps of engineers and a landscape engineer to lay out the entire area for the development of a well-shaped city in a way to make it the most desirable to live in. These engineers should locate streets, determine all grades, make locations for sewerage and water pipes, so that for a long time in the future every cent expended for city improvement would be in accordance with a predetermined plan. If we should take in the township to be the city we ought to make provision at once to get park areas, and above all things to get some one large park big enough to have golf links and to furnish places for recreation and amusement for the entire population of the city. It has been said that it would be a great imposition upon the farmer to take his land inside the city limits and make him pay city taxes. Experiences in the North and Northwest do not justify any such apprehension. A farm of 50 acres three and one-half miles from Charlotte might possibly now sell at the rate of $200 per acre. If such land was taken in the city limits and the city engineering corps should plat this with the other lands as a part of the city it would be salable by the lot instead of by the acre, and I think there are none who would doubt that lots could be sold for investment purposes and made deliverable 5 or 10 years hence at as much as $100 a lot, which would be the equivalent of $500 an acre, according to the layout. While the property was unsettled as city lots it could be used as farm lands as now. Heretofore the only way in which suburban property has been available to be divided up into city lots has been for a company to buy up one or more farms, and at their own cost to lay out streets, provide sewerage, water and lights. In this situation the owner of the farm lands can get no benefits except as farm lands. The development company gets the city values. In the new situation the owner of the farm land would get the benefit of the city values. If these various things could all be done it would give those conditions that would make Charlotte the central point for the new settlers and the territory taken in would soon be covered over with the developments of a modern city."

BRICKS AT BIRMINGHAM.

Indication of Building and Other Activities.

[Special Cor. Manufacturers' Record.]

Birmingham, Ala., December 29.

The condition of the iron market is just as firm this week as it was quoted last week. The volume of business this week is not as much as it was last week, but this was expected, and no one was disappointed. But there were sales in some cases at above the maximum prices of last week, and some at prices showing no change. One seller reports sale of No. 1 foundry at $24.50, delivery the first quarter of 1907. The same seller obtained $23.50 for No. 2 foundry, same delivery, and then accepted but a part of the order offered. Another seller let go No. 1 foundry for first quarter delivery at $23.50, and 1000 tons gray forge went at $18. Very little new business for first quarter can be accepted. But it might be that for reasons satisfactory to the holders some purchases may be resold at some concession from maker's price. Spot and first quarter prices are nearing each other, and in a few days will be together. If scarcity of iron for new business continues the doctrine of chances favors the moving up of the first quarter prices to the spot price.

There was only a moderate business done, because sellers chipped what was offered. For the seecond quarter quotations are on the basis of $19.50 for No. 2 foundry, and not much business results. For the last half of 1907, and in specific cases for the third and fourth quarters each, the price most generally quoted is on basis of $19 for No. 2 foundry. And it is being obtained by some interests. At the same time one important interest has been accepting business on the basis of $18.50 for No. 2 foundry. Anyone can readily perceive from the above stated facts that the market is very irregular. One gets a difference of $1 more for same grades than another, and another makes it at 50 cents more. So there is a difference of 50 to 75 cents, and even $1, between sales price of same grade. All that can be said is uniform prices are not prevailing. In his rounds the writer was accosted by a seller with "What is No. 2 foundry going at?" The reply was $23.50 first quarter. His instant response was: "We have some yet at $22.50." So there you are. Some are selling at $22.50 and some are getting $23.50. Attention is directed to the price at which gray forge is selling as compared to other grades. This condition cannot last long.

The best obtainable quotations on iron ore place values at $1 to $1.50, as to quality. But better values are being paid for hard red ore, and it would not be far wrong to say that ores would bring $1.75. As one mining firm expressed it, "the demand is overwhelming."

The pipe companies are having a continuous fine demand for their product, whose end puzzles them as much as the demand for pig-iron puzzles the furnace men. Quotations show about the same as last week, and are very firm. They are:

Four-inch to six-inch, $34.
Six, eight and ten-inch, $33.
Large sizes, $31.50.
Specials, 3½ cents.

For soil pipe quotations are reported as unchanged, with a whooping demand and increasing difficulty in filling orders. For two inches to six inches the prices are 50 and 10 off; for extra heavy the prices are 65 and 5 off, and for extra fittings the prices are 70 and 10 off.

The scrap-iron quotations are unchanged, and the demand is very good.

Old iron rails are $16.
Old iron axles are $20.
Old steel axles are $16.50.
Old car wheels are $18.
No. 1 railroad wrought, $20.
No. 2 railroad wrought, $16.50 to $16.75.
Wrought-iron pipes and flues, $12.50.
Railroad malleable, $16.
Malleable castings, $15.

Relay rails remain unchanged. The trade is suffering from lack of ability to fill orders received. For 56 to 60-pound relays the price quoted is $33.50, and for 30 to 40-pound relays the price quoted is $35.

In the movement of coal there is some promise of relief within the next 30 days from the strained condition from lack of cars. The railroad people are making desperate effort to pull out of the hole they are in, but there can be but little improvement made under 30 days from now. The quotations are still $1.50 to $2 run of mine, but emergency orders command a premium over quotations.

Coke is usually one price for furnace use and a higher price for foundry use. But the price now is $4.50 for each grade, with a ready market for all offerings.

The brick trade is a good barometer of building activity, and a request was made to the Jefferson Brick Co. for information that just now they were handicapped in their business by the lack of cars. Asked as to size of their orders, the reply came promptly, "10,000 to 500,000, to say nothing of the order of 3,000,000 from the Terminal Company." As fine brick in all the colors and all the grades as can be produced anywhere are made here. The quotation is $8 for standard grades. Gold bricks are barred.

The demand for brick upon our manufacturers here both for local and outside contracts is splendid evidence of the activity in building lines. It taxes capacity to supply it. And this demand is largely for high-grade pressed brick. The New York architects of the First National Bank building to be erected in Montgomery, Ala., selected the high-grade pressed brick of the Sibley-Menge Company out of a competition that was very keen. The same company has secured the contracts to supply their bricks to the Carnegie library building at Talladega, Jackson, Miss.; the Battle House at Mobile and the Episcopal Cathedral to be built at Savannah, Ga. To each place they are an effectual advertiser of the diversified industries of Birmingham.

It is a hard matter to ignore the progress being made at the terminal or union depot. A neophyte in such things looks at a big hole dug for the subway, and some buildings erected serve as guides to point out the site. But there will be no depot into which trains can enter and depart until next July, at which time all the trains of all the roads interested in the new depot must vacate the depot of the Louisville & Nashville Railroad. The plans of the new depot include profuse and costly decorations that will require months to complete. But when completed it will be "a thing of beauty and a joy forever."

The consensus of mercantile reports is that more people thronged the stores the past week than ever before in the history of the city, and that the receipts from sales were unprecedented. This is but one of the many evidences so palpably visible of the current prosperity of this city. It is to every intelligent and observing man a condition precedent to that greatness toward which we are constantly growing.

In conversation with Mr. J. D. Moore, the head of the large hardware firm of Moore & Handley, he stated that their trade was most excellent, and in all lines it was a noticeable fact that their trade was asking for a better line of goods, and it kept them on the jump to keep supplies in stock to satisfy the wants of their trade. He spoke of the difficulty of having goods shipped promptly from factory and of delays of shipment as a serious injury to the business. In machinery of all kinds the demand was unprecedented, and the quality desired was of the best. For the coming year this firm is preparing for the largest trade in their history. Mr. Moore not only voices his own experience in his statements, but also that of the hardware trade in Birmingham.

Mention has been made in these letters from time to time of the betterments to lines finished of the Birmingham Electric Railway, Light & Power Co. and their extensions. These can now be summarized, and consist of lines extended to Boyles, South Avondale, North Avondale, Bessemer to Jonesboro. During the year 19 new motor cars have been received. Seven other motor cars are due, as are also several trailers. During the year, in their own shops, the company commenced making their own cars, and so far have completed six motor cars and have four more under way. These facts are mentioned as evidence of intentions to supply their needs from their own shops. Let car manufacturers be convinced that cars can be made here to their advantage, and here they will come. Hence the successful efforts of the Birmingham Electric Railway Co. is an object-lesson that will attract attention and probably redound to important benefits to this locality. Thirty-six hundred boiler horse-power was added to its capacity during the year, and every device for increasing efficiency as soon as approved has been added. A mammoth power plant is now being considered, anticipatory of the increased demands of the near future. What could better and plainer illustrate the constant growth of all our material interests? It has kept ahead of anticipations, and there are no signs of diminution yet. The expenditures of the company in betteremnts and in reaching out for additional territory will foot up fully $1,000,000. For the coming year it is safe to say they will be no less. This is saying that the growth of the city will be such that this expenditure cannot be avoided. During the current year the capital stock was increased from $6,000,000 to $7,000,000.

Copying from the records we find that new corporations that came into being during the year and old corporations whose business demanded increased capital added $10,000,000 additional capital to the channels of trade. Two corporations added $1,000,000 each, one $800,000, one $625,000, two $500,000, several $250,000, and from t'ence down the row to a long list covering the small and diversified interests, which are the life of a manufacturing center. And this list includes only those interests that incorporated in Alabama. Add to it those incorporated in other States, and the total amount of capital interested in the district is so large that it will tax the credulity of many of your readers in accepting it as a fact. Yet it is all true. The records supply the facts. The writer has simply copied them. They are open to investigation. They carry their own comment.

J. M. K.

COST MORE THAN $1,000,000.

Handsome Addition to the Business Buildings of Nashville.

[Special Cor. Manufacturers' Record.]

Nashville, Tenn., December 31.

As a conspicuous acquisition to its structural growth the South can point to Stahlman Building, which stands at the corner of Third and Fourth avenues on Union street in this city. It is now complete in its essential parts, and requires only the touch of the embellisher's hand to fit it for occupancy. A number of the tenants will occupy their new quarters early in January.

The building is 12 stories high, and occupies the half-square bounded by the streets mentioned above and by the Fourth National Bank alley. In addition to this an annex is being built and will be completed soon after the main building. The annex was built on account of the ready demand which was met for offices in the building. The area occupied is 105x145 feet.

The cost of the building is $1,050,000, which may be taken as a verification of the fact that the builders did not depart from their originally-declared intention of erecting a building which for beauty, style of architecture and massive elegance cannot be surpassed anywhere.

The building is divided into two large banking rooms on the ground floor and 360 offices. The banking quarters will be occupied by the Fourth National Bank.

The exterior is the best Bowling Green stone, Powhatan brick and terra-cotta. The main corridors and banking rooms have an interior finish of Italian vein statuary marble throughout. The other floors are typical white Italian marble, with six-foot waiscoating. The doors and other wood trimmings are of the best mahogany.

The building is equipped with six hydraulic plunger elevators, with bronze frames and doors. The mail chutes, express chutes and other metal fixtures also are in genuine bronze.

The general contract for the building was executed by John T. Wilson of Richmond, Va.

HAYNES MCFADDEN.

REVIVAL AT AUGUSTA.

Ten Recent New Industrial Enterprises or Enlargements.

[Special Cor. Manufacturers' Record.]

Augusta, Ga., December 31.

The new year witnesses a great industrial revival in Augusta. A summary of the enterprises recently launched and put into operation puts a glowing aspect on the future of the city. No less than 10 new enterprises or enlargements of old factories and plants will be noted within the period covered by the last three months of the old year and the first three of 1907.

Local capital has a confidential feeling as to the future of the section, and this is the cause of the great development. In the last few days the Augusta Mattress Factory has decided to enlarge its plant and add new capital, so as to meet the demands made on it for the product of different styles of mattresses. This is an important concern, and may be the means by which a furniture factory will be started. Woods of the finest kind can be found in close proximity to the city which can be utilized to advantage in the manufacture of furniture.

The Augusta Broom Factory also will enlarge its plant and increase its capacity. The broom factory here holds out more than a passing opportunity to one set of men. The business men among the merchants could do well by patronizing home industry and take the entire supply made by the local factory. Another feature about the broom factory is the inducement to the farmers to grow broom corn. Broom corn will flourish in this section, and in recent years the price has advanced to such a figure as to make it very profitable. Here is an opportunity for the farmers to diversify and start up a new work, and a strictly co-operative plan could be established all the way around. The broom factory could trade with the farmer and the merchant with the broom factory, and so on ad infinitum.

Augusta is the greatest hay center in the South, and there is about 100,000 bales of hay grown in the district annually, and consequently there is a great demand for hay presses and improved implements. Plans are now on foot for the organization of a stock company for the manufacture of hay presses, harrows, plows and other farm implements, with a capital of $25,-

000. Already $11,000 has been raised, and it is very probable that the other will be subscribed soon. The organizers are not making a special effort to raise the money by publicity, but they declare that if they do not get the full amount needed they will go into the work on a small scale and they are confident of success.

Work on the Armour fertilizer plant is well under way, and the manager announces that everything looks favorable to completion by the first of February. The company is expecting to ship fertilizers out to farmers by the middle of February.

The work of putting up the buildings of the Hahn Pottery Co. is in progress, and the machinery is on the way now, and by the first of March the plant will be in operation.

The Georgia Bagging & Tie Co., which will be one of the first enterprises of its kind in the South, will be in operation some time in January. Announcement of the organization of the company was made in November, and the machinery has now arrived and will be put in place without any delay. The plant will be located on the corner of Center and Reynolds streets, and will have a capacity of 2500 yards of bagging daily. Much of the product for the coming year has already been sold, and it is expected that by the first of March the entire product for a year will be sold.

Morris & Wolfe, two experienced book men, will start a bookbindery within the next month, and this will be a valuable small enterprise for Augusta.

J. C. McAULIFFE.

TO DEVELOP CALHOUN FALLS.

About 40,000 Horse-Power for Transmission by Electricity.

Plans which have been under consideration for some time for the development of the water-power of Calhoun Falls, South Carolina, have been fully formulated, and the MANUFACTURERS' RECORD has been advised of the principal details. From 30,000 to 40,000 horse-power will be obtained, to be transmitted by electricity for the operation of manufacturing enterprises and other industrial plants in the territory reached. The Calhoun Falls Company has been incorporated, with a capital stock of $280,000, to undertake this development, the incorporators named being Messrs. M. C. Butler of Edgefield, S. C.; A. T. Smythe of Charleston, S. C., and Henry J. Bowdoin of Baltimore, Md. This company will organize with Patrick Calhoun, 30 Broad street, New York, as president of the board of directors, and all arrangements will be made for beginning construction work soon and pushing it to completion as quickly as possible. Messrs. Viele, Cooper & Blackwell of 40 Wall street, New York, are making the preliminary surveys for this development. The engineer to be in charge has not yet been engaged. The enterprise will be financed and the plant established by Messrs. Hugh MacRae & Co., Colorado Building, Washington, D. C., and Wilmington, N. C. They should be addressed for information.

At a meeting of the stockholders Patrick Calhoun was elected president; Augustine T. Smythe, vice-president, and H. F. Gaus, secretary-treasurer. Messrs. Calhoun, Butler, Smythe, Gaus, Bowdoin, Andrew P. Calhoun and Frank R. Frost were elected directors.

To work done by the Chamber of Commerce of Chattanooga, Tenn., Secretary W. B. Royster of that organization attributes the addition to the city during the past year of a modern hotel, a modern office building, a paper mill, large paint works, a cotton-gin plant, improvement of the street-car service, of fire rates and of fire insurance premiums, uniform sidewalks, better market gardens and immigration.

STREET PAVEMENTS IN THE SOUTH.

In the South, from Maryland around to Texas, the year 1906 has seen more permanent street improvements undertaken than any previous year. Its record has been 188 miles of permanent street pavements laid or contracted for at an approximate cost of $7,100,000. In computing the mileage of pavements a 30-foot roadway is taken as the standard. In yardage this amounts to 3,286,000 square yards.

Although this record more than doubles that of 1905, it looks as though it, in turn, will be increased nearly 100 per cent. in 1907. Not only are the larger cities contemplating extensive street improvements for this year, but the smaller cities, those of 8000 population and less, will have from one to several miles of permanent roadway to construct to replace the macadam, chert or clay on their leading business and residence streets.

As much as any other one thing, this increased interest in paved streets bespeaks the prosperity of the South. In every State save one the movement to pave streets starts with the property-owners, who are assessed for the improvement from one-fifth to the entire amount. That property-owners should feel the need of better thoroughfares so strongly as to petition for them at their own expense means nothing more than an increased bank account and an increased civic pride. And both are necessary for the beautified city.

In selecting the material with which to pave their streets the choice of Southern cities has included all the standard materials to some extent. Brick and bitulithic, however, have been the more frequent selection. Sheet asphalt, although laid in a number of the larger cities, has shown a much decreased yardage. Asphalt blocks have been laid in two or three cities; wood blocks in some other cities, and granite blocks, as usual, have been placed where the street was subjected to heavy wholesale traffic, but comparatively few streets of this character have come up for improvement the past year. The brick plants that have furnished vitrified brick and blocks for Southern work have had all they could do to supply the demand, and the bitulithic contractors have been forced to carry over to 1907 a large number of contracts that they found themselves unable to execute in the rush that they encountered. As regards price, wood blocks and granite blocks have demanded the highest figure. Bitulithic has ranged from $2 to $2.75, according to price of materials. Brick has sold, on six-inch concrete foundation, from $1.80 to $2.25 a square yard, and on sand foundation from 82½ cents to $1.65 a yard. From such work, however, only very ordinary results have been obtained. Asphalt has been offered in these States from $1.60 to $2.25, the average being considerably under $2. Five-year guarantee has been the rule.

In the distribution of paving materials the bitulithic and asphalt are found in the larger cities, together with some brick which in these municipalities has been placed in alleys and on side streets. For the best residence streets and for the retail business streets the least noisy pavements have been preferred. On such streets the bitulithic shows a gain over asphalt.

In the medium-sized cities large amounts of brick have been used, very little asphalt and an increasing amount of bitulithic. In the small municipalities, where permanent pavements have been laid, brick and bitulithic have been the materials. Some of the improvement work done by States was as follows:

In Tennessee, Knoxville has let contracts for 120,000 square yards of pavement, divided among bitulithic, sheet asphalt and brick. For the former $2.27 a square yard was paid, for asphalt $1.97 and for brick, pitch filler, $2.17. In Memphis 30,000 yards of asphalt were given to the local company, and 22,000 yards of the same material were laid on a last year's contract. Chattanooga has had a little resurfacing of asphalt and brick to do, and Nashville has been inactive save for construction of several miles of macadam streets in the suburbs. Bristol has laid some brick by city labor.

In Arkansas one of the largest contracts of the year was awarded. Fort Smith was the city. Awards were made for paving practically every street in the city, amounting to 600,000 yards, with a locally made brick on sand foundation. The price was 82½ cents a yard. Hot Springs is laying 25,000 yards of sheet asphalt, securing it, under 10-year guarantee, at $1.88. Pine Bluff has done a little paving, and Little Rock, while attempting to lay over 100,000 yards, has been held up by objecting property-owners and has done nothing.

Mississippi has been very much alive, and will in 1907 turn out as much paving as any other Southern State. The past year Hattiesburg divided 60,000 between bitulithic and brick, securing the former at $2.35 and the latter a little less. Meridian has been laying brick on 1905 contracts, and Vicksburg will put this material down on one of its streets. This year Jackson, Natchez, Gulfport, Vicksburg and other Mississippi cities will undertake street improvements.

In Alabama, Birmingham has continued to be foremost in this line of work. Over 200,000 square yards of bitulithic has been laid and contracted for, and the city has worked steadily ahead in its purpose to pave all the leading business and residence streets with this material. In addition to this, the two vitrified-brick plants at Birmingham have been given contracts for about 40,000 yards of brick, which has been used around freight sheds, between car tracks on the wide streets and in alleys. Mobile, which has used asphalt with poor success, has awarded contracts for approximately 50,000 yards of bitulithic. Montgomery has split its 40,000 yards of work among brick, bitulithic and asphalt, and will probably have many times that much to do this year. Anniston is laying bitulithic on its leading business streets. In 1907 all of these cities, together with practically every city in the State over 4000 population, will get to work on improving streets.

Virginia has had small amounts of paving done in seevral cities. Suffolk contracted for 20,000 yards of bitulithic at $2.15, and for 19,000 yards of brick at about the same figure. Roanoke has laid 23,000 yards of brick and Norfolk has put down a small amount of sheet asphalt. Richmond has laid 20,000 yards of asphalt blocks.

In Maryland, Baltimore has been practically the whole thing in street work, but this city has hardly hit the stride which it will in 1907. After a long and bitter opposition on the part of the asphalt people the bitulithic pavement has been allowed to enter, and contractors for this material have been given several contracts. Brick, wood blocks and asphalt brocks have also been laid.

In Louisiana good-sized contracts have been let in New Orleans, Baton Rouge, Donaldsonville and other cities. New Orleans has for years been a great city for asphalt in its effort to make its leading streets attractive and quiet, and this year contracts for 85,000 yards have been awarded for this material. This is smaller than in previous years, and is accounted for by the entrance of the bitulithic paving into the city. In the middle of December bids were taken on 66,000 yards of bitulithic, and ordinances for about 200,000 yards more have passed Council or are now before that body. For asphalt prices have ranged from $1.90 to $2.30, and for bitulithic around $2.75. In Donaldsonville 20,000 yards of bitulithic was given to contractors at $2.53, and in Baton Rouge 60,000 yards of bitulithic were laid. Shreveport finished up its bitulithic contracts of 1905, and had 10,000 yards of asphalt to lay. Lake Charles contracted for 20,000 yards of brick at $2.08.

In spite of the difficulty of assessing abutting property for street improvements on account of the Homestead law, Texas, has had a marked boom in improvements. Brick and bitulithic have been the materials used, to the practical exclusion of all others, and of the 500,000 yards of paving laid and contracted for in that State during the year, 200,000 square yards have been brick and nearly 300,000 yards bitulithic. The brick has been laid in Galveston, Houston, Austin, Paris, Gainesville and Greenville, with a little in Dallas. The bitulithic paving has been contracted for by El Paso to the extent of 115,000 yards, and Dallas has undertaken to lay over 140,000 yards. Fort Worth is also laying this pavement, one contract being for 20,000 yards. Bitulithic paving has brought around $2.35 a square yard, and brick has ranged from $2 to $2.25 a square yard. A large amount of street work will be done all over the Lone Star State this year.

Down in Georgia, Atlanta has resurfaced Peachtree street with asphalt, getting the material at the bargain price of $1.24 a square yard, with 10-year guarantee. Several blocks of new asphalt was also laid, and in the West End 30,000 yards of bitulithic were laid. In Savannah the city bought and laid with its own labor a fair amount of brick. Columbus contracted for 36,000 yards of bitulithic and 15,000 yards of brick. Waycross and Thomasville both laid small contracts of brick, the former on sand foundation. La Grange and Albany put in a few blocks of brick, about 25,000 yards in all.

In Florida, Jacksonville awarded a contract for 10 miles of brick paving, laid on sand. This was secured at prices ranging from $1.61 to $1.65 a square yard. Tampa and West Tampa both laid brick in the same fashion, and the coming year will see Live Oak, Orlando and Pensacola with considerable paving to do.

Spartanburg is the only city in South Carolina that invested any considerable amount in paving last year. An original contract for 60,000 yards bitulithic has been recently run up to 70,000 yards, and will be 100,000 yards before work is completed. Greenville has completed 1905 brick contracts.

In North Carolina Asheville this year, as for the past three, has laid considerable bitulithic, the total amount laid and contracted for in 1906 amounting to a little over 100,000 yards. Salisbury has contracted for 25,000 yards of bitulithic.

Kentucky has reported very little done in Louisville, where a fair-sized asphalt contract was turned into granite block after the award was made. Paducah has put in 25,000 yards of bitulithic and about 15,000 yards of brick. Ashland, which has undertaken the paving of all its leading streets, has put down 20,000 yards of bitulithic and has laid and contracted for 80,000 yards of brick. Lexington is one of the Southern cities to put down wood blocks, and Covington has spent a little in street improvement.

Taken as a whole, Southern cities, whether large or small, have taken thought

in the award of street-paving contracts, and have demanded the best materials and the best construction. Climatic conditions are different, of course, in the Gulf States from condition North or West, and the test on materials is much more severe on account of the protracted heat and continued moisture. And the South has learned that, in this matter as well as others, the best is in the end economical.

Gulfport, Miss.

Mr. S. C. Gardner, secretary of the Progressive League of Gulfport, Miss., writes to the MANUFACTURERS' RECORD under date of December 27 that all lines of business are brisk; wholesale shipments are very heavy. A shipload of pyrites is being unloaded for the Gulfport Cotton Oil & Fertilizer Co., the shipment coming from Huelvas, Spain. Orders for lumber and lumber products are being received by the Gulfport merchants for export to foreign countries.

The Coast Livery & Undertaking Co. has invested $30,000 in business in Gulfport, and is already doing a most satisfactory business.

L. M. Cozart & Co., recently of Louisville, Ky., have just opened up a wholesale fruit and produce establishment, and have orders booked insuring a good trade in that line.

The Gulfport & Mississippi Coast Traction Co. is improving its properties, laying sidings on 13th street, setting poles and extending its lines.

The Consolidated Iron Works of Gulfport are putting in position an enormous spar on the bark Brunheld.

Several farms have recently been purchased and set out in paper-shell pecans, which thrive most excellently in this soil.

Dairy Demonstration Farm.

Referring to the proposed Government dairy demonstration farm for Denison, Texas, T. W. Larkin, secretary of the Denison Board of Trade, writes the MANUFACTURERS' RECORD as follows:

"The Government dairy demonstration farm to be established here will be the only institution of the kind in the United States. It will be a model farm in every respect, one calculated to attract attention and inspire our Southern farmers. The primary purpose of this farm is to demonstrate the profit and practicability of dairy farming in this section. The buildings and general arrangements on the farm will be under the direction of the various divisions of the Department of Agriculture, located and designed with a view to the greatest comfort and convenience. The farm will be operated under the direction of the Agricultural and Mechanical College of Texas, acting in co-operation with the United States Department of Agriculture. Mr. H. N. Slater, a Government dairy expert, has been assigned to the management of the farm."

To Preserve Forests.

The American Association for the Advancement of Science at its final session in New York adopted a resolution urging Congress to pass at the present session the bill now before the House which provides for the establishment of national forest reserves in the White mountains and the Southern Appalachians. The resolution calls the attention of Congress "to the increasing seriousness of the results of the rapid and reckless destruction of forests in the White mountains and the Southern Appalachian regions about the headwaters of important interstate rivers."

Pulp from Cotton Stalks.

The MANUFACTURERS' RECORD is advised that J. L. Daniels of Gaffney, S. C., is organiisng a company to introduce a machine, which he has invented, for manufacturing fiber and pulp from the stalks of the cotton plant. The company will have a capital stock of probably $500,000, and it will be the aim to dispose of the shares of stock to cotton-growers, thereby securing the co-operation of the latter in placing the machines. By Mr. Daniels' plan the cotton stalks can be worked up into fiber and wood pulp with the power now used to operate the gins, thus making it convenient for cotton-growers to have their cotton stalks prepared for market without handling or hauling a bulky mass a distance. The company will probably be known as the Cotton Stalk Fiber Machine Company.

States at Jamestown.

More than 30 States will be represented by separate buildings at the Jamestown Exposition, which is to open in April. Connecticut, Illinois, Maryland, Massachusetts, Missouri, New Jersey, North Dakota, Ohio, Pennsylvania, Rhode Island and Virginia have already started the erection of their buildings; Florida, Georgia, Kentucky, Louisiana, New York, North Carolina, Vermont, West Virginia and the District of Columbia will begin construction within the next month, and the others expected to begin at a later date are Alabama, Delaware, Idaho, Mississippi, Michigan, Montana, Oregon, South Carolina, Tennessee, Washington and Wisconsin.

Ironmaking in Texas.

The incorporation of the Rusk Iron Co. of Rusk, Texas, is believed to be a step which will be followed by steady progress in the development of iron manufacturing at Rusk, in addition to the iron furnaces operated there by the State with prison labor. The new company is incorporated by Messrs. Walter H. Oatley, Vernon W. Records, John S. Wightman and Amos J. Mitchell with a capital stock of $250,000. It will operate the Star and Crescent iron furnace, now undergoing repairs. Mr. Oatley is president and general manager; Mr. Mitchell (of Beaumont), vice-president, and Mr. Wightman, treasurer.

The Cotton Movement.

In his report for December 28 Col. Henry G. Hester, secretary of the New Orleans Cotton Exchange, shows that the amount of cotton brought into sight during 119 days of the present season was 7,864,929 bales, an increase over the same period last year of 883,052 bales. The exports were 3,971,027 bales, an increase of 611,189 bales. The takings were, by Northern spinners, 1,155,839 bales, a decrease of 49,705; by Southern spinners, 979,544 bales, an increase of 30,683 bales.

American Goods for Russia.

Maksylmiljan Rubinstein, Konstantynowska 18, Lodz, Russia, writes to the MANUFACTURERS' RECORD as follows:

"I permit myself the great liberty of asking if you would not aid me in securing agencies for American goods. Ten years' practical experience has made it possible for me to become thoroughly acquainted with local conditions. I handle all kinds of goods, especially novelties, which are salable in Russia. I can give ample references."

Messrs. S. B. Wilkins, W. L. Jenkins, W. E. Patton and W. Y. Wilkins have incorporated the Ora Manufacturing Co. of Cowpens, S. C., for the purpose of building a cotton mill. The company's capital stock is $30,000.

If you are thinking of enlarging your mill, factory or mine, or of purchasing machinery of any kind, send the MANUFACTURERS' RECORD *a postal card giving the character of the machinery needed, and we will make your wants known free of cost.*

LUMBER

Turpentining Experiments.

According to Bulletin 145 of the Forest Service of the United States Department of Agriculture, ever since the cup and gutter system of turpentining was first introduced experiments have been made to further reduce the wound inflicted in harvesting the turpentine. It is said to be the common practice in chipping trees to cut the trunks so deeply that the life of the tree is shortened unnecessarily. In order to find out whether shallower chipping might not secure at least an equal crop of turpentine, and at the same time prolong the productive life of the trees, as well as to determine whether it would not be more profitable to chip only the maturer trees, experiments have been begun near Jacksonville, Fla. Five crops of 8000 trees each, including all sizes from six inches in diameter upward, are being experimented upon. One crop of trees was worked in the ordinary way, both as to height and depth of the faces chipped and the number of faces cut on each tree. This served as a standard to measure results obtained from the methods tried in the others. With the first crop chipping was reduced to half the ordinary depth; in the second to half the ordinary height, and in the third to half the ordinary depth and height. In the fourth crop, limited to trees 10 inches and over in diameter, the chippings were of ordinary size, but all trees between 10 and 16 inches in diameter had not more than two faces, the usual practice being to chip more on trees of this size. In addition, narrower faces were chipped on the smaller trees and wider ones on the larger trees of this crop. Definite results of the experiments have not been determined, but the yield for this year indicates the following: Reducing the size of the face by one-half in height or depth will give an equal first-year yield and a larger total yield for the working period. Reducing the size of the face one-half in both height and depth will materially increase the annual yield. Crops of the larger size trees, with fewer and smaller faces, will produce a considerably larger annual yield than ordinary crops, in which the large and small trees are chipped severely and the larger trees have more faces. It is concluded that the conservative method will insure the best annual yield and the best total yield for the working period. It is believed that by cropping the larger trees only and reducing the size and number of the faces the cropping can continue for eight or ten years, by which time the smaller trees will be ready for cropping. In this way it is said the same area will supply the operator indefinitely and the industry will be greatly prolonged without destroying the Southern pine forests.

Will Erect Sawmills.

The Kitchen Lumber Co. of Kitchen, N. C. (not a postoffice), advises the MANUFACTURERS' RECORD that it has incorporated with a capital stock of $100,000 and will develop about 25,000 acres of virgin timber which it has purchased in Swain and Graham counties, North Carolina. The company will erect two eight-foot band mills and perhaps one six-foot portable band mill, together with tramways, and will be in the market for two complete sawmill plants, logger, logging cars, etc. The capacity of the plants will be about 100,000 feet of lumber per day. The property is located on the railroad now being constructed from Bushnell, N. C., to Maryville, Tenn., development operations not to begin until the line is finished, which is expected to be some time during the present year. Officers of the company are Messrs. Charles Kitchen, president; R. H. Vansant, vice-president; John W. Kitchen, treasurer, and James H. Kitchen, secretary. For the present mail should be addressed to the company at Leon, Carter county, Kentucky.

To Develop Timber Lands.

The Town Creek Railroad & Lumber Co. is reported to have been organized at Wilmington, N. C., with Messrs. R. F. DeVane of Red Springs, N. C., president; A. J. McKinnon of Maxton, vice-president, and Z. W. Whitehead of Wilmington, secretary and treasurer. It is understood that the capital stock of the company is more than $250,000, and its purpose is to develop extensive timber properties in Brunswick county. This property is said to consist of about 100,000,000 feet of cypress timber and from 25,000,000 to 30,000,000 feet of hardwood. The company has in operation at Town Creek a sawmill with a daily capacity of 30,000 feet, the plant comprising planing mills, dry-kilns, shingle mills, etc. It has also acquired a standard-gauge railroad 14 miles long, extending from Town Creek south toward Lockwood's Folly, which will probably be extended 12 miles farther to Wilmington, and then to Southport or to Little River, S. C.

Enlargement of Hardwood Mill.

Messrs. Milkey Brothers of Wrightsville, Ark., are reported as having acquired a site at Felsenthal, Ark., to which they will remove their hardwood plant from Wrightsville, increasing its capacity. The plant will be located in close proximity to the Starnes Lumber Co.'s planing mill, and will have direct access to a sidetrack recently constructed, making it possible to handle the lumber directly from the saws and yard to the cars. It is said to be the intention of Milkey Brothers to construct a railroad due east from their plant to the lake and north to Coon Glory landing on the Ouachita river, along which they expect to cut a good deal of pine and hardwood.

Turpentine Extraction Plant.

The Great Southern Lumber Co., F. H. Goodyear, president, Ellicott Square, Buffalo, N. Y., is reported as preparing to install a turpentine extraction plant to operate in connection with its sawmills at Bogalusa, La. The plant is stated to cost about $75,000, and will use the refuse from sawmills, such as stumps, trunks and other waste parts of the timber for manufacturing turpentine. The process to be employed in the extraction of the turpentine is a steam process which at present is not in general use, it being stated that only one other plant employing the same process is in operation.

Lumber Notes.

The Beaver Dam Planing Mill Co. of Beaver Dam, Ky., has been incorporated with a capital stock of $150,000 by Messrs. C. M. and H. D. Taylor of Beaver Dam and A. C. Taylor of Central City, Ky.

Timber and lumber exports from Pensacola, Fla., for the week ended December 22 aggregated about 10,000,000 superficial feet. This is considered an exceptional record for the port, in view of the fact that shippers are only exporting first-class lumber.

The Bellgrade Lumber Co. of Memphis, Tenn., has been incorporated with a capital stock of $100,000 with Messrs. W. I. Crenshaw, president; A. N. Thompson, vice-president; John W. McClure, secretary and treasurer; T. M. Cathey, general manager, and F. P. Gerhart, assistant manager. The company, it is said, will operate mills at Belzonia, Miss., and will have its yards at Memphis.

RAILROADS

[A complete record of all new railroad building in the South will be found in the Construction Department.]

IN WESTERN ARKANSAS.

A Region Where There Is Opportunity for Railroad Building.

One of the most interesting pieces of work in the railroad development of the western half of Arkansas is the building of the Gurdon & Fort Smith Railroad by the Missouri Pacific system. The company is now finishing up 40 miles of line constructed during the past year from a point near Antoine, Ark., northwest along the Antoine creek through Caddo Gap to a point near Black Springs. This carries the line into Montgomery county, which is one of the few remaining counties in Arkansas that are without railroad facilities. And it is expected that the further construction of this line will be continued to Greenwood, in Sebastian county, 65 or 70 miles farther, to make a through line to Fort Smith. At present there will be a terminal established near Black Springs, where the company has about 13 acres of ground and is preparing the necessary track and buildings.

That portion of Arkansas lying northwest of a line drawn from the northeastern corner of the State to the southwestern corner has developed slowly in the matter of railroad construction as compared with the section lying southeast of such a line. The latter is pretty well filled up with railroads, but the former, with the exception of two or three east and west roads, is only partially developed. The principal existing lines are two routes of the Missouri Pacific, one of them being the White river divison, that was only lately completed, and the other is the Rock Island line, formerly known as the Choctaw, Oklahoma & Gulf. The Kansas City Southern and a line of the St. Louis & San Francisco skirt the western border of the State, but north and south of the Arkansas river there are large tracts of territory that have been waiting for years for railroad facilities. The Missouri & North Arkansas Railroad, formerly the St. Louis & North Arkansas, is making an effort to supply the needs, and has already built within the last year or two an extension southeast from Harrison to Leslie, and it has now put under contract a further extension from Leslie to Pangburn that will carry it nearly over to the dividing line mentioned. But it proposes to do even more than this, having in contemplation a further extension from Pangburn to Helena, Ark., on the Mississippi river. It has also considered a suggestion to build a branch to Little Rock, but this has not yet been decided upon.

There are other lines working in this northwestern half of the State, but most of them are small projects for industrial purposes, such as lumber development.

New Equipment.

The Gulf & Ship Island Railroad has ordered from the American Car & Foundry Co. about 300 freight cars, and the Nashville, Chattanooga & St. Louis Railway has given an order for 500 box cars to the same company.

The Georgia Railroad, it is reported, will buy 500 freight cars of several different types.

The Missouri & North Arkansas Railroad has ordered 30 freight cars from the American Car & Foundry Co.

The Knoxville Railway & Light Co. is about to receive 13 new cars, some of them double truck, with airbrakes.

The Jacksonville Electric Co. of Jacksonville, Fla., is to soon receive some new double-truck airbrake cars built at the Brill works in Philadelphia.

The Columbus Railroad Co. of Columbus, Ga., has just had built several new cars for its lines.

The Chattanooga Railways Co. of Chattanooga, Tenn., bought its 15 new cars from the Kuhlman Car Co. of Cleveland, Ohio.

The Norfolk & Western Railway is to build 1500 freight cars at its Roanoke, Va., shops.

The Seaboard Air Line is reported building 250 flat cars at Portsmouth, Va.

The Missouri, Kansas & Texas Railway, it is said, proposes to purchase 1250 fruit cars, 1000 coal cars and 2750 box cars.

The Fort Smith & Western Railway, it is reported, will buy two locomotives.

The De Queen & Eastern Railway has ordered one locomotive from the Baldwin works.

The Pennsylvania Railroad Co. is reported to have ordered 4000 steel gondola cars from the Standard Steel Car Co. The same company is also said to have ordered 2000 box cars from the American Car & Foundry Co.

The Georgia Northern Railroad will, it is reported, buy some new freight equipment, besides two passenger coaches and one baggage car.

The South & Western Railway has ordered one passenger coach 60 feet long from the Hicks Locomotive and Car Works.

The Texas & Pacific Railway has received four 10-wheel passenger engines from the Rogers Works.

The Tidewater Railway, according to a report from Norfolk, Va., has awarded contracts for 700 to 800 coal cars to be delivered within the next two months.

A TRUNK-LINE PROJECT.

St. Louis, Oklahoma City & Henryetta Railway Co. Makes Final Survey.

The St. Louis, Oklahoma City & Henryetta Railway Co. has, according to report, completed its final survey from Henryetta, I. T., to Oklahoma City, and the plan has been financed with the exception of the usual bonuses which will be requested at points along the proposed route. The survey was made by Geo. W. Drumheller of New York, and representatives of the line are reported to be closing contracts for both bonuses and right of way on the route.

The project was started about two years ago by A. E. Sumner of New York, and it appears that it is now about to be carried out. The principal object of the line at present is to furnish an outlet at Oklahoma City for coal from the mines at Henryetta, but it is further stated that the road will be a link in a proposed trunk line of which two sections of about 600 miles are now in operation, while two others are under construction and two others are being surveyed. The backers of the project are not yet named, because, it is said, to state them at present might prevent some of their plans. The syndicate that is interested in the St. Louis, Oklahoma City & Henryetta Railway is also interested in the several links referred to.

The officers of the Oklahoma City, Henryetta & St. Louis Railway are: President, J. H. Dibble; vice-president and treasurer, J. H. Wheeler; secretary, J. W. Pryer; general counsel, J. W. Shartel.

The Statehood Construction Co., which is to build the link from Henryetta to Oklahoma City, with two extensions, making a total of 280 miles, has officers as follows: President, R. T. Edwards; secretary, R. H. Gardner; treasurer, J. H. Wheeler.

De Quincy to Baton Rouge.

The Colorado Southern, New Orleans & Pacific Railway is about to begin construction of important works at Port Allen, La., on the Mississippi river, opposite Baton Rouge. There will be a double-track incline to be used for ferry work across the river, besides roundhouse, shops, yards and other terminal facilities. Notwithstanding the amount of work to be done, it is all expected to be finished by May 1.

The company will also build immediately a roundhouse, shop buildings and other structures, besides terminal yards at De Quincy, La. The main shop building will be 60x100 feet long. The contract for all this work has been awarded to the Kenefick, Hammond & Quigley Construction Co. of Beaumont, Texas.

It is expected that train service will be started on May 1 as far as Atchafalaya river, working from De Quincy on the west and Port Allen on the east. The bridge across the river will require some time later to complete, as the work through the river swamp is difficult. There will be built in the swamp 20,000 feet of temporary trestling, but it will be filled in as soon as possible, the work of permanent construction beginning as soon as the first mile of trestle has been finished. Rails are en route from Baltimore, and will be laid as speedily as possible. The steel for the Atchafalaya bridge will not be received for a month or so.

Illinois Central Improvements.

Mr. H. McCourt, general superintendent of the Illinois Central Railroad at Memphis, Tenn., is reported as saying that upon the completion of the double-track steel drawbridge across Pass Manchac, which will be finished within a month, the company will have double track all the way from Jackson, Miss., to New Orleans, La., excepting for 14 miles between Kenner and Frenier. Second track is, however, being laid on that uncompleted portion and will be finished early in 1907. Then the company will have a double track or its equivalent as far as Memphis. The double-track work north of Memphis is being pushed, and is to be completed during 1907, so as to give second track all the way from New Orleans to Chicago.

The company is soon to build second track on the Yazoo & Mississippi Valley Railroad between Memphis and Lake Comorant. Work is also under way on the line between Lake View and Memphis. Moreover, the company is building a new freight yard at McComb City, Miss., and is remodeling and enlarging the passenger station at Jackson, Miss., where a new fireproof freighthouse has also been completed. The passenger train yard there is being enlarged. At Harahan the new shops are being built at a cost of about $75,000.

Southern Pacific Report.

The twenty-second annual report of the Southern Pacific Company and proprietary companies covering the year ended June 30, 1906, has appeared in pamphlet form. It shows gross earnings $105,632,549, increase as compared with the preceding year $10,117,391; operating expenses and taxes $70,585,188, increase $4,611,753; receipts over operating expenses and taxes $35,047,360, increase $5,505,638; surplus $38,372,032, increase $6,204,885; surplus over fixed charges $20,542,785, increase $6,798,185; surplus over fixed and other charges $19,192,647, increase $6,760,674.

The company carried 22,454,894 tons of revenue freight, increase 3,094,164, or 15.98 per cent., and the ton mileage thereof was 6,236,597,303, increase 747,054,346, or 13.61 per cent.; the average receipts per ton per mile of revenue freight was 1.025 cents. The company carried 14,406,532 revenue passengers, excluding ferry suburban passengers, who numbered in addition 18,612,293, making a total of 33,018,825, the percentage of increase being, respectively, thus, 5.21, 15.58 and 10.81. The average receipts per passenger per mile (other than ferry-suburban passengers) was 2.243 cents.

Joplin to Pond Creek.

The St. Louis, Oklahoma & Pacific Railroad has applied for a charter at Oklahoma City to build a line from Joplin, Mo., via Bartlesville, I. T., to Pond Creek, Okla.; capital $7,200,000.

One of the purposes of the road, it is said, is the development of oil and gas fields around Bartlesville, in the Osage Nation, but it will also reach the zinc and lead region of Missouri and Kansas. It will furthermore tap the Oklahoma wheat belt in the Cherokee strip, going via Ponca City.

The incorporators are F. M. Overlees, president; H. J. Holm, secretary, both of Bartlesville, I. T.; Conrad Strecker of Pond Creek, treasurer; George B. Keeler and J. J. Curt of Bartlesville, W. M. Barnum and Michael Cunyan of Ponca City and J. W. Bird of Pond Creek.

In Connection With a Railroad.

The new steamship Ogeechee of the Brunswick Steamship Co., which is to run in connection with the Atlanta, Birmingham & Atlantic Railway, will, it is reported, sail from New York January 5 for Brunswick, Ga. She is of the same type as the steamship Satilla, now in service between Brunswick and New York, being of 2000 tons capacity and so constructed as to carry a large amount of freight. Two more ships are to be added to the fleet as soon as possible. The Brunswick, the new passenger steamship of the company, is to begin service on January 5 between New York, Brunswick and Havana.

New Buildings at Birmingham.

Mr. A. S. Baldwin, chief engineer of the Illinois Central Railroad, writes from Chicago to the MANUFACTURERS' RECORD that the terminal facilities for the company at Birmingham, Ala., are being constructed by the Alabama Western Railroad, a subsidiary line of the Illinois Central. The buildings to be erected are a 10-stall 75-foot roundhouse, machine and repair shops 60x220 feet, blacksmith shop 50x208 feet. oilhouse and storehouse 20x45 feet, sandhouse 30x50 feet, coalbins, cinder pits and water station. The cost of buildings and equipment will be $150,000.

Railroad Notes.

Mr. William Henry White of Norfolk, Va., has begun his new duties as president of the Richmond, Fredericksburg & Potomac Railroad, to which post he was recently elected.

A circular from the office of J. B. Berry, chief engineer of the Rock Island lines, announces that the jurisdiction of H. F. White as engineer of maintenance has been extended over all the company's lines, J. G. Bloom having been assigned to other duties.

The Chicago, Rock Island & Pacific Railroad Co. has arranged to place through Speyer & Co. of New York $10,000,000 of trust and refunding 4 per cent. bonds, the proceeds of which will reimburse the treasury for expenditures on account of equipment, improvements and betterments.

The Jackson (Tenn.) Woolen Mills is reported as to increase capital stock from $60,000 to $100,000. This company is now rebuilding its woolen manufacturing plant, previously destroyed by fire.

COTTONSEED

NEW COTTONSEED MILLS.

More Than Fifty Projected During the Year.

By casual observers or by those who have not closely followed the development of the cottonseed-oil industry in the South the mistaken inference may be drawn that the splendid activity which this industry enjoyed a decade and a half ago is now abating. Following the impetus given to the establishment of cottonseed-oil mills, fertilizer factories and other plants for the manufacture of cottonseed products, when the possibilities of the cottonseed became known, there has been, perhaps, a falling off in the rate of increase in the number of new plants established in recent years, but the general industry, rather than decreasing, has increased constantly and remarkably. This is attested by the fact that the majority of the mills established during the infancy of the industry are still in operation and new ones are being projected with gratifying frequency.

With reference to the latter it may be stated that a review of the general industrial news of the MANUFACTURERS' RECORD for the calendar year of 1906 shows that more than 50 cottonseed-oil-mill enterprises have been projected in the South during this period. Leaving out of consideration a number of companies which have been referred to simply as contemplating the establishment of new plants, or of rehabilitating or enlarging established plants, but whose plans were not reported in detail, there were 45 industries reported in the States of Alabama, Georgia, Mississippi, Louisiana, North Carolina, South Carolina, Tennessee, Texas and Oklahoma. These reports embrace the mention of new plants, as well as of the enlargement and improvement of established plants, and show that in many instances large amounts of capital have been employed. It is possible that a few of the companies included in the reports referred to never materialized, but in the absence of any information to this effect, and basing an estimate upon reports available, it may be stated that the aggregate amount of capital employed in the organization of the companies and for the consummation of their plans was upward of $3,000,000. Of this total, about $1,125,000 is accredited to Oklahoma, which leads the other States in the aggregate capitalization of its companies organized during the year. This is accounted for by the fact that a single company was reported in Oklahoma as incorporating with a capital stock of $800,000 for the purpose of establishing a cottonseed-oil mill, together with a distillery for manufacturing alcohol after the denatured process of manufacture.

Of the other States, Georgia has a total of nine cottonseed-oil industries reported during the year, including new companies organized and established plants as contemplating improvements. The total capitalization as reported for these enterprises is about $400,000. Following Georgia, in order as to the number of new enterprises with which each is accredited in 1906, are Alabama with eight industries, representing a capital of about $300,000; Oklahoma and Texas, each having six, with an aggregate capital of about $1,500,000; Mississippi having five, with a capitalization of about $300,000; North Carolina having two, with a capitalization of about $230,000; South Carolina and Louisiana having three each, with an aggregate capitalization of about $300,000, and Tennessee with one enterprise, whose capital is not reported.

While the above figures are not claimed as absolutely accurate, since no recent information has been obtained from the companies reported as organizing during the year as to whether they actually established new cottonseed-oil mills or improved established ones, according to the purpose of their organization, they will serve to show that the condition of the industry in the South is a healthy one. And as the demand increases everywhere for cottonseed products it is safe to predict that in the coming years this section will be able to meet the needs of the industry, both as to the establishment and maintenance of the required number of plants, as well as to the employment of advanced methods of production.

Completing Cotton-Oil Mill.

The cottonseed-oil mill and fertilizer plant under construction at Aberdeen, Miss., for the People's Oil Mill & Fertilizer Co. is nearing completion, and 10 carloads of machinery for its equipment have been received. It is stated that 30 carloads of machinery altogether will be needed for the equipment of this plant, and the installation of it will be accomplished as soon as possible. The railroad tracks to the mill will also be laid at once.

American Architects to Meet.

The fortieth annual convention of the American Institute of Architects will be held in Washington, D. C., January 7, 8 and 9. The occasion will be one of the most memorable ever held, and many delegates distinguished in their profession will be in attendance from all parts of the country.

At a reception to be given in his honor Sir Aston Webb, R. A., formerly president of the Royal Institute of British Architects, will be presented with the first institute medal, which is to be given each year to some architect who has particularly distinguished himself in his profession.

The American Institute of Architects was organized in 1857 by 30 of the leading architects of that time, and its fiftieth anniversary will be celebrated at a formal banquet at which will be present prominent representatives of the National Government, fine arts, literature and education.

During its existence the institute has accomplished many noteworthy results. Through its efforts Congress provided for competition for the erection of public buildings; the appointment of a commission for beautifying Washington was secured; it prevented the remodeling of the White House and Capitol along lines affecting their architectural beauty; it secured the permanent location of the Mall in Washington and the future location of public buildings on it in a systematic manner; it was largely through its efforts and influence that the American Academy of Fine Arts was established in Rome, and it has done much toward influencing the development of municipalities along systematic and esthetic lines.

Building Steel Barges.

The Maryland Steel Co. of Sparrows Point, near Baltimore, Md., has been given a contract to build four steel car barges for the New York Central & Hudson River Railroad, each to be 260 feet long and 40 feet wide. The company is also building several other pieces of marine equipment, including a passenger transfer steamer 260 feet long for the New York, Philadelphia & Norfolk Railroad, to run between Cape Charles and Norfolk, Va.; a passenger steamer 296 feet long for the Old Bay Line of Baltimore, another passenger steamer 290 feet long for the Boston & Philadelphia Steamship Co. and two dredges each 284 feet long for the Panama Canal Commission.

MINING

Zinc and Lead Developments.

The MANUFACTURERS' RECORD is informed that Messrs. Blue & Nunn of Marion, Ky., who own the mineral rights under 150 acres of land in Crittenden county, Kentucky, near Marion, are organizing the Nine-Acre Mining Co., with a capital stock of $100,000, for the development of lead and zinc deposits. The company will use the Sanders Ore Separating Co.'s process in the separation of its ore and enlarge the steam plant, adding to it an air compressor and pneumatic drills, and sink the shaft 100 feet deeper, it already having been sunk to the depth of 100 feet. A concentrating plant of 50 tons daily capacity will be constructed, and operations are expected to begin during the winter. It is estimated that within one and one-half years the underground and surface developments will amount to a daily output of 50 tons. The vein of lead and zinc ore is said to run about 125 rods across the property, cropping out in several places.

Another prospective development of like character is that of Messrs. John Drescher of Louisville, Ky., and R. D. Drescher of Marion, with their associates, who are said to have obtained a sublease from the Columbia Mining Co. on about 375 acres of lead, zinc and fluorspar-bearing lands, the veins in which the ore is found being fissure veins. It is understood that a company will be organized for the development of the property and will install air compressors, modern equipment for concentrating the ores and make other improvements.

Increased Its Facilities.

The Green River Coal Co., referred to last week as increasing its capital stock from $100,000 to $125,000, informs the MANUFACTURERS' RECORD that the new issue of stock was taken by the present stockholders. The company has installed an entirely new equipment at its mines near Spottsville, Ky., including the construction of tipple, installation of automatic cages, new boilers and 100-kilowatt electric generator with engine. It has relaid its mine throughout with 16 and 20-pound rail and installed electric haulage. The property being developed comprises about 4000 acres of land, which is said to contain two veins of coal 48 and 60 inches. Equipment for loading vessels on river will be installed next spring and summer. Officers of the company are Messrs. William Clendaniel, president, and R. L. Biddle, secretary and treasurer, both of Donora, Pa. Mr. R. C. Hubbard is the superintendent in charge of improvements. The business office of the company is at Evansville, Ind., and the mine office at Spottsville, Ky.

Great Southern Mica Co.

Officers of the Great Southern Mica Co., 1322-1324 Citizens' Building, Cleveland, Ohio, which recently incorporated with a capital stock of $100,000, are Messrs. J. J. Sullivan, president; Carlos M. Stone, vice-president, and Hubert H. Ward, secretary-treasurer. This company was recently reported as arranging to develop mica and other mineral lands in Randolph county, Alabama, but will not announce its plans at this time. Mr. Emery W. Fisher, R. F. D. No. 1, Newell, Randolph county, Alabama, is the superintendent of mines.

Buys Kentucky Coal Lands.

A dispatch from Sergent, Ky., states that George W. Kelley of Pine Top, Ky., acting for Congressman Campbell Slemp of Virginia, has purchased about 7000 acres of coal and timber lands in Knott county, Kentucky. It is understood that a company will shortly be organized to develop the property.

The Camden-Mayo Coal Co. of Ashland, Ky., has been incorporated with a capital stock of $1,000,000 by Messrs. J. W. M. Stewart, B. E. Whitman, James G. Serey and John M. Hopkins.

CEMENT USERS TO MEET.

Programme of Their Annual Convention at Chicago.

At the third annual convention of the National Association of Cement Users, to be held in Chicago, Ill., January 7 to 12, inclusive, a number of papers dealing with the various phases of using cement for construction purposes and other matters of kindred interest will be read by men who are thoroughly familiar with each subject. These will include the following papers: "Cement Sidewalks," Albert Moyer; "Reinforced Concrete," W. K. Hatt; "Reinforced Concrete," S. W. Thompson; "Proportions, Mixing, etc., for Mortars and Concrete," "Artistic Use of Concrete," A. O. Elzner; "Finish for Concrete Surfaces," A. O. Elzner; "Concrete as a Plastic Material," H. H. Quimby; "Concrete Blocks," H. H. Rice; "Concrete-Block Architecture and Waterproofing," Edward De Knight, J. W. Fist, G. G. Fry and H. Weiderhold.

Interesting reports from the following committees will also be read: Streets, sidewalks and floors, George L. Stanley, chairman; testing cement and cement products, E. S. Larned, chairman; art and architecture, Charles D. Watson, chairman; concrete blocks and cement products, M. S. Daniels, chairman; machinery for cement users, J. F. Angell, chairman, and fireproofing and insurance, E. T. Cairns, chairman.

A large exhibition hall has been equipped with 137 spaces for exhibiting the products of the various manufacturers, and in many cases the actual construction of the various concrete blocks and other materials will be shown.

From all accounts this convention will be the best attended and most interesting and instructive that has ever been held. The extraordinary progress that has been made in so short a time in the use of cement for building purposes in the form of concrete blocks, reinforced concrete, etc., is almost without precedent, and the indication of this progress is in no way shown as in the growing influence and attendance upon the conventions of this association.

Phosphate and Timber.

The Mutual Mining Co. of Savannah, Ga., has been incorporated with a paid-up capital stock of $200,000 for the purpose of developing phosphate and timber lands. It is said to own about 22,000 acres of land in Citrus, Sewanee, Marion, Lafayette, Levy and Alachua counties, Florida, from which a good grade of phosphate can be mined. Preparations are being made for the installation of two phosphate plants, and a third will probably be installed during the summer. The annual output is expected to be from 30,000 to 40,000 tons. The naval-store branch of the business, it is stated, will not be actively pushed at first, but it is the ultimate intention of the company to operate both for foreign and domestic trade. The company is also said to have acquired timber lands along the Savannah river to be developed for export purposes. Officers of the company are Messrs. George F. Armstrong, president; John R. Williams (of Florida), vice-president, and Robert W. Groves of Savannah, secretary and treasurer.

Real-estate transfers at Memphis, Tenn., in 1906 represented $11,261,360.

MECHANICAL

IMPORTANT TO COTTON MILLS.

An Improved Tubing Twister Well Tested.

One of the most important needs of the cotton and flax manufacturing industry has been the production of a high-speed tubing twister frame which would produce a perfectly formed and tubed strand in large quantity per spindle for the better classes of work ranging from four-ply 10 yarn to the large strands now required for woven hose, braided cordage, cotton duck and a multitude of other fabrics and products. A textile machinery builder says:

"At the present time all twisting is done either by the ring or open flyer system. The ring system is capable of a high speed, but is very much limited by the drag, or take-up friction, as all manufacturers are aware, and this is emphasized as the bobbin becomes nearly full, when an added amount of tension is needed to overcome the great leverage of the larger diameter of the work on the bobbin. Another decided defect lies in the ring and traveler easily wearing out when a heavy tension is required.

"The open flyer system has a slight advantage over the ring system, inasmuch as the tension can be regulated as the bobbin fills, but the efficiency of this tension depends entirely on the intelligence and attention of the operator, while it has a disadvantage over the ring system in the fact that the speed is limited through the flyer legs spreading under high speed.

"Both the ring and the flyer twister systems have two serious defects—first, the absence of any tubing or compressing device, which are absolutely necessary for the production of perfect strands, and second, the slipping of driving bands caused by small spindle whirls.

"Briefly, the defects of both of these systems are as follows: Poor take-up tension on both types; poor work, due to absence of tubes or compressors; poor work, due to slack bands; limited speed of flyer twisters, due to spreading of legs; excessive breakdowns of work, due to poor tension; less amount of work on bobbins, due to light tension; unequal band tensions on spindles."

To meet these difficulties and defects in the present system the Haskell-Dawes Machine Co. is introducing an improved tubing twister, which has been declared by several experts in the trade to be a radical departure from old methods and the very best twister yet produced.

These frames are built with 20 spindles each (10 to each side), 5x7 bobbin, occupying a floor space of 3 feet 3 inches wide by 11 feet long by 4 feet high (without creel), and will run easily at a speed of 2300 revolutions per minute.

The marked advantages of these twister frames are stated as "positive drive, equal to gearing; positive yet sensitive friction or take-up; producing tubed work with a tube which gives the finish of a solid tube and yet allows knots, splices and other slight defects to pass without breaking down the work; product can be changed from right to left hand twist with little trouble or waste of time; will use a regular bobbin or one with a conical head, the latter being desirable when the product is to be balled, reeled or finished in cops, the product leaving the bobbin as freely as from a cone or tube; will produce work 25 per cent. stronger than if made on a ring twister.

"By actual tests, 5x7 bobbin on these twisters will hold four times as much work as the 4x5 bobbin on a ring twister. This is due to the strong tension, making a hard bobbin without a knot.

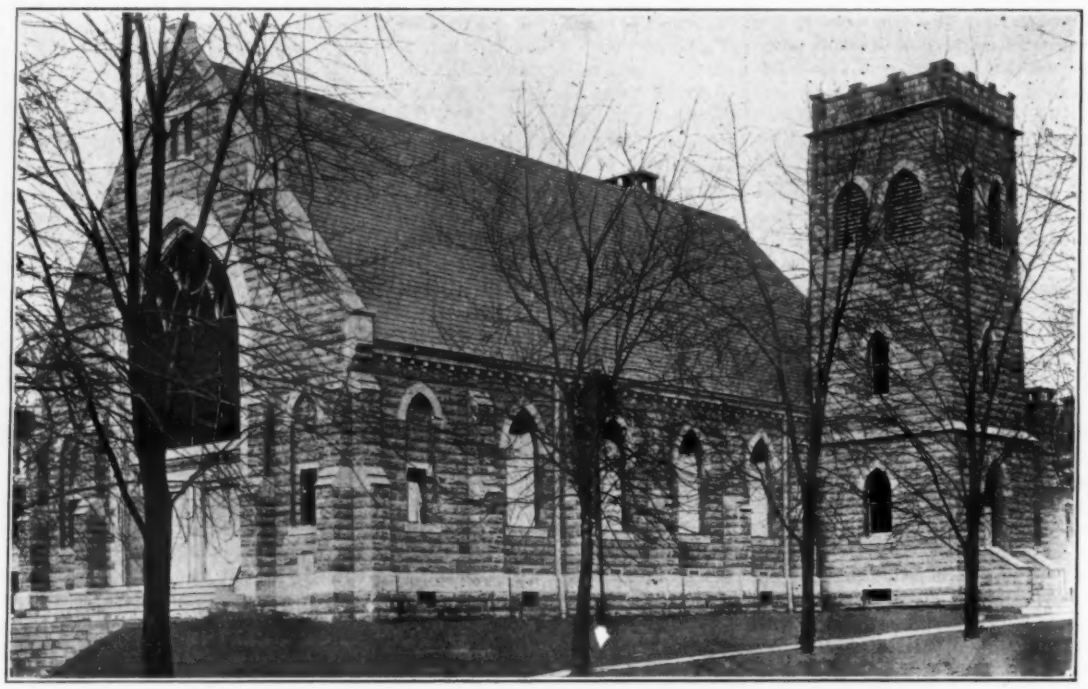
"This work can be put at once onto the beaming creel, saving spooling and knots, and also having the stretch out of the work, which for duck, woven hose or braided work is a very important feature."

It is said a number of important tests have been made, in the presence of experts, which have proved conclusively the claims made for this improved high-speed tubing twister, and that it will meet a long-felt want in the production of perfect strands.

The new twister is manufactured by the Haskell-Dawes Machine Co., 176 Federal street, Boston, Mass. This company is prepared to show the new twister at its shops, Erie and Trenton avenues, Frankford Junction, Philadelphia, Pa.

A Hydraulic Pressed Stone Church.

Concrete stone has become so perfected that it requires the close scrutiny of experts to distinguish it from natural stone. With this perfection has come an increasing use of this material in buildings embodying modern architectural features. Possibly one of the most important buildings of this character is the $40,000 Walbrook Presbyterian Church recently completed at Baltimore, Md. Every stone in this structure was made of concrete, and the accompanying illustration shows the close similarity to natural stone. This stone was made by the National Hydraulic Stone Co., Baltimore, under the system of machinery built by the Fisher Hydraulic Stone & Machinery Co., Baltimore, and from the manner in which it is made popularly termed hydraulic pressed stone.



WALBROOK PRESBYTERIAN CHURCH—BUILT OF HYDRAULIC PRESSED STONE.

It was originally intended to use Gwynn's Falls or Falls Road stone, local species of gneiss that can be placed in the wall for from 20 to 25 cents per cubic foot, or about $5.40 per perch. About this time the attention of the architects was called to the success that had been attained in the use of hydraulic pressed stone, and after investigation by architects and building committee the National Company was invited to bid on the stone work. This bid was several thousand dollars lower than any bid received for the local natural stone, the cheapest natural stone obtainable in this section. It was accepted, and although the company's plant was about that time destroyed by fire, the stone was delivered on time and the building completed at a considerable saving.

Messrs. Mottu & White, the architects for the building, in a letter to the Fisher Company, said that in their investigation they were satisfied the hydraulic pressed stone was a dense stone with high crushing and tensile strength and a minimum water absorption, and in awarding the contract to the National Company a saving of $2500 was effected over the figures for natural stone. This sum did not include saving effected by dispensing with furring and lathing by plastering directly on the concrete blocks, and that the advantage of a hollow wall was obtained, which would not have been possible with natural stone. They add: "Concrete-block construction is more or less in an experimental stage, and we hesitated before making a decision. We now feel that we made no mistake when we adopted your system for the church. We have recently had occasion to cut a hole in one of the exterior walls. We found the blocks in perfect condition and 50 per cent. harder than when they were set. While our building is very plain, it presents a good and substantial appearance, and the contrast between the walls and trimming stones is very effective. We see no reason why your material could not be successfully used in the most elaborate buildings."

Mr. John McKnight of Baltimore, general contractor for the building, who has built 68 church buildings in Baltimore and Washington, in a letter to the Fisher Company said: "In the first place, your method compacts or condenses the concrete thoroughly and uniformly, which is very essential. In the second place, it is practicable with your system to use sufficient water to obtain full binding power of the cement. This I consider of vital importance. The necessary result of these two conditions is to produce genuine stone if good materials are used—stone of very little absorption, great strength and unquestionable durability. Again, the facilities for making stone in almost any dimensions are very attractive and necessary. I consider the method of wall construction very valuable. If hydraulic pressed stone made with good materials is laid up into a wall in the manner you direct it is bound to make a damp-proof wall that can be safely plastered against, and the bond is strong and safe. I consider the superiority of the Fisher system of manufacture and your method of wall construction to be beyond question, and I should not hesitate to erect a building 200 feet high with your angle or channel stone."

The Fisher Hydraulic Stone & Machinery Co. will exhibit a complete working plant of its system at the annual exhibition of the National Association of Cement Users, Chicago, January 7 to 12.

Combined Drier and Laundry Stove.

Many important improvements in household conveniences have been introduced in recent years. The laundry features of the home are among those factors of usefulness and convenience which have received attention. In connection with this the accompanying illustration of a combined drier and laundry stove will be of interest. This equipment consists of a metallic cabinet equipped with sliding racks upon which the clothes are hung, with laundry stove attached. The laundry stove serves the purpose of boiling clothes, heating flatirons, heating water by water-back system if desired, and heating the drying cabi-

COMBINED DRIER AND LAUNDRY STOVE.

net, thus drying the clothes by what would ordinarily be waste heat. The manufacturer of this specialty has been very successful in offering clothes driers not only for residences, but also for apartment buildings, hotels, hospitals and other institutions. The driers are constructed of metal throughout, and can be heated by the manufacturer's stove-heating system, gas, steam or hot water. This combined drier and laundry stove is manufactured by the Laundry Dryer & Heating Co., St. Louis, Mo.

The "Chicago Midget" Rotary Drill.

A most unique and novel air drill, with a capacity for drilling up to and including three-sixteenths inch in steel, is herewith illustrated. Its weight is two and one-half pounds; distance from top of breast plate to end of spindle, seven and five-eighths inches; from center of spindle to outside of housing, one inch; motor speed, 22,000 R. P. M.; spindle speed, 2000 R. P. M.

"CHICAGO MIDGET" ROTARY DRILL.

This is the "Chicago Midget" drill. The machine is of the rotary type, is said to operate at full speed without vibration, and is particularly adapted to drilling tell-tale holes in staybolts or general light work where accuracy is required. This machine has been produced and is being marketed by the Chicago Pneumatic Tool Co., Chicago, Ill.

The Link-Chain Belt.

Makers of power equipment and other machinery, operators of mills, factories and other plants where power is transmitted are invited to investigate the link-chain belt shown by accompanying views. The chain is made in six sizes, and in those six is given a breaking strain of 15,000 pounds, where it requires, it is stated,

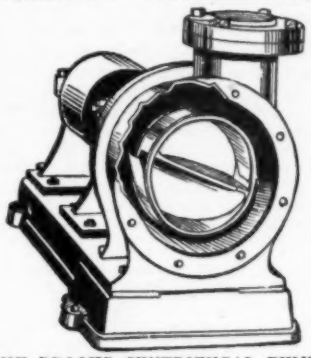
THE LINK-CHAIN BELT—CAN BE USED FOR CROSS-DRIVE.

160 sizes of the old style to give the same breaking strain. This belt requires less space and is a saving of power. It runs accurately and does not wabble, as it works on the principle of a pinion gear and can be used within 17 and 24-inch centers as a direct drive for motors. This chain belt is being operated at a speed of 850 revolutions from the main shaft, and it is practically noiseless. It does not become clogged from grease or dirt, thereby saving friction. It is claimed to be the only cross-belt chain that will work within four-foot centers; this applies to the smaller sizes and 8 to 12-foot on the larger sizes. This belt is also being operated at a quarter-turn on the larger sizes within 18-foot centers and giving entire satisfaction. The manufacturer is equipping paper mills, cottonseed-oil works, tanneries, breweries, fertilizer works, sugar refining works and other plants where chain belt can be used. The belt is also used extensively for coal conveying, woodworking machinery and concrete mixers.

The Link Chain Belt Co. of 52 Dey street, New York, makes this chain.

The Brooks Centrifugal Pump.

Users of pumping machinery will be interested in the accompanying view of the Brooks centrifugal pump. This pump has the Brooks style of runner, departing from established ideas, runs at a comparatively low speed, has a large open space between the piston and the cylinder on all sides, discharges air as it is received, instead of accumulating it, has a pressure against the stuffing-box instead of the suction pull, has a simple open piston which permits of handling thick liquids, paper pulp, sand and pebbles, etc. It lends itself readily to



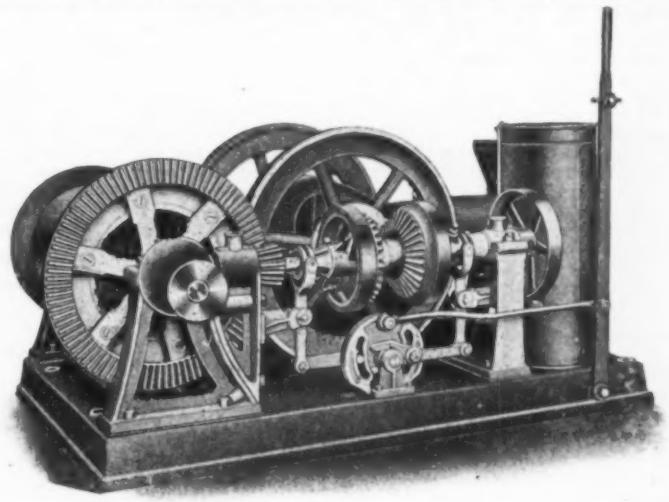
THE BROOKS CENTRIFUGAL PUMP.

lining with protective metal for handling chemicals, is susceptible of the minimum amount of wear on account of its compact and simple design, and eliminates bearing troubles by its comparatively low speeds and special design. It is stated this pump is good for a total suction of 31 feet, or a vacuum of 28½ inches, and for maximum discharge heads it is readily adapted to any required service. It is driven by every form of power and of driving device. The Dayton Hydraulic Machinery Co., which was organized for the purpose of manufacturing this pump, has provided large new and thoroughly modern shop facilities, which include a splendidly-equipped hydraulic testing laboratory. Every pump is thoroughly tested and a record of same made before it leaves the shops. Many large corporations which have the best engineering talent at their disposal use Brooks pumps, and a large percentage of orders for the pumps are "repeat" orders.

The Southern representative for the Brooks pump is the Southern Hydraulic Engineering Co.; offices in Atlanta, Ga., and Birmingham, Ala.

The York Hoisting Engine.

An accompanying illustration presents a view of the York hoisting engine. This machine is applicable to all kinds of hoisting, such as elevators, contractors to operate derricks, hoist beams, timber, brick for bricklayers, or in any way that a rope or cable can be attached. It is not fitted to hoist by power and lower by brake only, but has a positive drive on lowering with a brake appliance. To operate an elevator it can be hoisted one inch at a time, lowered one inch at a time, stop the load at any point of travel and hold the same. It



THE YORK HOISTING ENGINE.

will operate one or two brick and mortar elevators.

One of the features of this machine is that it has but one lever to control the up and down motion and apply and release brake. This is so arranged that it does not require a man with the hoisting engine, but a cable is used, and the man on the first, second or tenth story, or any place between the highest point and the engine, has full control of it. On this feature the labor of one man is saved. This is an entirely new design of gasoline hoist, and patents are now pending. The manufacturer is the Flinchbaugh Manufacturing Co. of York, Pa.

Benjamin "Anti-Night" Light.

Users of electricity for lighting purposes interested in improved fixtures and lamps will find their attention attracted to the accompanying illustration of the Benjamin

BENJAMIN "ANTI-NIGHT" LIGHT.

"Anti-Night" Light. Referring to this fixture, the manufacturer says:

"The 'Anti-Night' from shade to tip of bottom of lamp is snow white. It is like a huge opal of graceful outline, radiating light. The harmony of its parts are perfect. They are so grouped that all shadows are eliminated. The light furnished is pure in quality. It is easy on the eye, yet is so strong and evenly diffused that every part of the room reached by its rays is light as day. The outer and inner lamps may be operated independent of each other, thus securing any amount of light desired for any given occasion. As compared with the arc lamp, the cost is 50 per cent. less.

"Lights of some kind are a necessity with every storekeeper. Heretofore there was no alternative but to charge the cost of maintaining them to the expense account, pure and simple. With the advent of the 'Anti-Night' the point of view has been shifted. The storekeeper's lighting equipment becomes one of his most valuable business assets. If conditions could be reversed, and the necessity for artificial illumination removed, he would still choose to retain it."

The manufacturer is the Benjamin Electric Manufacturing Co. of 42 West Jackson Boulevard, Chicago, Ill.

Durham's Hospital.

Durham, N. C., is to have a new hospital which, as far as modern equipment is concerned, will be equal to any in the country. This building and equipment, the first cost of which will be between $100,000 and $150,000, will be erected and presented to the city by Mr. George W. Watts of Durham, and it is his plan to add to it each year, according to its growth. Mr. Watts has commissioned Kendall, Taylor & Stevens, architects, of Boston, Mass., to prepare the necessary plans and specifications. The building will have an initial capacity of 50 beds, and all of the requirements of a modern hospital and training school. It will be of fireproof construction, probably reinforced concrete, and will be equipped with electric wiring and fixtures, a detached steam-heating plant, electric or water elevators and other facilities of the latest improved design.

Fort Smith Improvements.

According to the Fort Smith (Ark.) *News-Record*, many improvements and enterprises have been completed or started in that city during the past year. These include awarding of $1,000,000 paving contract, involving erection of $100,000 brick plant; $750,000 sewerage contract, two and one-quarter miles of street-railway extension, $100,000 pants factory, interurban electric franchise, $25,000 Carnegie library, a number of new buildings being constructed and additions being made to old ones, six-story office building, $50,000 furniture factory, organization of Arkansas Valley Trust Co. with $250,000 paid-up capital and United States Traction Co. with $100,000 capital.

Construction Department

TO OUR READERS!

In order to understand and follow up properly the Construction Department items, please bear in mind the following statements:

EXPLANATORY.

The MANUFACTURERS' RECORD seeks to verify every item reported in its Construction Department by a full investigation and complete correspondence with everyone interested. But it is often impossible to do this before the item must be printed, or else lose its value as news. In such cases the statements are always made as "rumored" or "reported," and not as positive items of news. If our readers will note these points they will see the necessity of the discrimination, and they will avoid accepting as a certainty matters that we explicitly state are 'reports" or "rumors" only. We are always glad to have our attention called to any errors that may occur.

* Means machinery, proposals or supplies are wanted, particulars of which will be found under head of "Machinery, Proposals and Supplies Wanted."

In correspondence relating to matters reported in this paper, it will be of advantage to all concerned if it is stated that the information was gained from the MANUFACTURERS' RECORD.

ADDRESS FULLY.

To insure prompt delivery of communications about items reported in these columns, the name of one or more incorporators of a newly incorporated enterprise should be shown on the letter addressed to that town, or to the town of the individual sought, as may be shown in the item, as sometimes a communication merely addressed in the corporate or official name of a newly established company or enterprise cannot be delivered by the postmaster. This will help to insure prompt delivery of your communication, although it is inevitable that some failures on the part of the postal authorities to deliver mail to new concerns will occur.

WRITE DIRECTLY.

It is suggested to advertisers and readers that in communicating with individuals and firms reported in these columns, a letter written specifically about the matter reported is likely to receive quicker and surer attention than a mere circular.

ALABAMA.

Bessemer, Ala.—Sewing-machine Factory.—A company is being organized by J. M. Brosius to establish plant for the manufacture of the "Brosius" no-treadle sewing machine.*

Birmingham, Ala.—Railroad Repair Shops, etc.—Alabama Western Railroad, subsidiary of the Illinois Central Railroad, will construct shops, etc., at Birmingham, referred to last week. The buildings will consist of a 10-stall 75-foot roundhouse, machine and repair shop, 60x220 feet; blacksmith shop, 50x208 feet; oilhouse and storehouse, 20x45 feet; sandhouse, 30x50 feet; coalbins, cinder pits and water station; cost of buildings and equipment $150,000. A. S. Baldwin, Chicago, Ill., is chief engineer.

Birmingham, Ala. — Drug Company — Gorman-Gambill Drug Co. has been incorporated with $5000 capital stock to deal in drugs. J. B. Gorman is president and manager; C. K. Gambill, vice-president, and J. B. Gambill, secretary.

Childersburg, Ala.—Real Estate and Manufacturing.—Childersburg Realty & Manufacturing Co. has been incorporated with $20,000 capital stock by D. A. Oden, J. A. Nicholls and others.

Elrod, Ala.—Lumber Plant.—Elrod Lumber Co. has been incorporated with $20,000 capital stock by S. A. Berry of Elrod, M. S. Harper of Reform, Ala., and T. H. Betty of Montgomery, Ala.

Gadsden, Ala.—Barytes Mines.—It is reported that Nelson, Klein & Co. of St. Louis, Mo., has purchased the property of James L. Green at $6000 and will arrange to develop barytes mines.

Huntsville, Ala. — Natural Gas Developments. — The New York-Alabama Oil Co. (New York offices at 32 Broadway, Room 811) has drilled 11 wells and is drilling two more, seven of the wells being producers of natural gas, which is being distributed in and around Huntsville for fuel and lighting purposes. This company was previously incorporated with a capital stock of $1,000,000 and has about 40,000 acres of land under lease, is operating two drilling outfits and has contracted with a driller for 10 wells. It is offering special inducements to manufacturing enterprises needing natural gas. The company has a franchise from the city of Huntsville for furnishing gas and is now laying pipe; one and a half miles of piping has been ordered. Tracy W. Pratt is general manager at Huntsville.

Littleton, Ala.—Sawmill.—C. T. Lowry of Bristow, Ala., has purchased the sawmill of McCoy & Head and 1300 acres of timber land in the vicinity. It is stated that the new owner will increase the capacity of plant.

Mobile, Ala.—Paving.—Southern Bitulithic Co., Nashville, Tenn., has contract for 5307 square yards of bitulithic in addition to 40,000 yards referred to November 27.

Montgomery, Ala. — Street Paving. — Contract will be let January 21 for grading various streets with hexagon block or Schillinger pavement. R. S. Williams is City Treasurer.*

Newell, Ala.—Mica Mines.—Great Southern Mica Co., reported last week as incorporated to develop mica mines in Randolph county, has offices at 1322-1324 Citizens' Building, Cleveland, Ohio. J. J. Sullivan is president of the company; Carlos M. Stone, vice-president, and Hubert H. Ward, secretary-treasurer, all of Cleveland, Ohio; Emery W. Fisher, R. F. D. No. 1, Newell, Ala., is superintendent of mines.

Prattville, Ala.—Water-works and Sewerage.—Town will vote January 21 on the issuance of $30,000 of bonds for water-works and $10,000 for sewerage (mentioned last week). Will Anderson is Clerk.

Tuscaloosa, Ala. — Land Improvements. — East End Realty Co. has been organized with capital stock of $20,000 for land improvement purposes; F. W. Minnish, president, and H. B. Foster, secretary.

Tuscaloosa, Ala. — Telephone Exchange. — The Southern Bell Telephone Co., main offices, Atlanta, Ga., has purchased site for erection of its proposed new exchange; to be a two-story brick structure.

Mobile, Ala.—Paving.—Cafyen & Carter of Rochester, N. Y., have been awarded contract at $26,764.90 for the wooden block pavement on Dauphen street from Claiborne to Julia.

ARKANSAS.

Argenta, Ark. — Power Plant. — Argenta Light & Power Co. has awarded contract to J. H. Leveck at $5426 for the erection of power-house, 40x93 feet; building will be of white brick, with concrete floor. J. M. Griffin is president of the company.

Biscoe, Ark. — Sawmill. — Brasfield-Thompson Lumber Co. has been incorporated at Memphis, Tenn., with $50,000 capital stock to operate sawmill recently purchased. Geo. M. Brasfield is president, and J. W. Thompson, vice-president; main office, Rogers Building, Memphis, Tenn.

Culberhouse, Ark. — Lumber Company. — Chartered: Borgman & Son Lumber Co. with $15,000 capital stock by F. J. Borgman, J. A. Borgman, Delos Craddock and Minnie Craddock.

DeVall Bluff, Ark.—Shuttles and Shuttle Blocks.—Anchor Mill Block Co., organized by Joseph Gardner of Liverpool, England, to manufacture shuttles and shuttle blocks used in weaving, has begun the erection of proposed buildings.

Felsenthal, Ark.—Hardwood Mill.—Milkey Bros., formerly of Wrightsville, Ark., have secured site on which to locate hardwood mill having a daily capacity of 50,000 to 60,000 feet.

Fordyce, Ark.—Lumber and Ice Company.—Sparkman Lumber & Ice Co. has been incorporated with $65,000 capital stock by L. Sparkman, Ed Harper, Jeff Hicks, V. L. Webb, Arthur C. Webb and T. J. Goughan.

Fort Smith, Ark.—Iron and Wire Works.—William Sparling and Ed Sparling are reported to establish plant for the manufacture of window-guards, bank rails, etc.

Fort Smith, Ark.—Printery.—S. C. Hammond, Fred J. Kline and Frank R. Griffin have incorporated the Hammond Printing Co. with $20,000 capital stock.

Fort Smith, Ark.—Vinegar Factory.—Oklahoma Vinegar Co., J. H. Dunn, secretary and manager, has secured site on which to locate proposed plant; main building will be of brick, 100x350 feet, and building for the storage of cucumbers will have a capacity of 100,000.

Greenwood, Ark.—Coal Mines.—Greenwood Co-operative Coal Co. has been organized with $10,000 capital stock. Development work will begin at once. Ves Scales is president; C. A. Epley, secretary, and W. N. Morrow, treasurer.

Greenwood, Ark. — Electric-light Plant. — City has granted franchise to Ben Fylle, James Derby and J. B. Douglas as trustees for the establishment of electric-light plant.

Little Rock, Ark.—Cotton Mill.—It is understood that N. C. Roe of Monticello, Ark., is planning to build a cotton mill at Little Rock.

Little Rock, Ark. — Paper Mill. — Adison Weeks of St. Louis, Mo., is negotiating for the location of a paper mill.

Little Rock, Ark.—Rock Quarry.—Charles M. Newton, Oscar Davis and Walter J. Terry have incorporated the Charles M. Newton Trap Rock Co. with $100,000 capital stock to operate rock quarry.

Reedville, Ark. — Sawmill. — Reported that the Allan-Kernes Lumber Co., formerly of Fulton, Ark., will shortly begin the erection of sawmill.

Van Buren, Ark.—Sewerage System.—Contract will be let January 22 for constructing 17,600 feet of clay-pipe sewers; Theo. Hartman, 1122 Center street, Little Rock, Ark., engineer in charge. L. H. Southmayd is commissioner Sewer District No. 1.*

DISTRICT OF COLUMBIA.

Washington, D. C. — Power Plant. — The Westinghouse Electric & Manufacturing Co., Pittsburg, Pa., was the lowest bidder at its bid of $533,728 for the equipment on a steam turbine basis of the new power station for the group of buildings around Capitol plaza. Joseph G. Cannon, Speaker House of Representatives, is chairman of building committee and J. G. White & Co., 43-49 Exchange place, New York, are the consulting engineers.

Washington, D. C.—Radiators.—The Portable Parallel Hot Water Radiator Co. has been incorporated with capital of $50,000 to manufacture radiators by Alfred B. Leet, 613 14th street N. W.; Frank H. Wheelock, 1215 G street N. E.; John H. Clapp, 1024 Vermont avenue N. W., and Elias R. Levy, 442 New York avenue N. W.

Washington, D. C.—Steamship Company.—The Chesapeake & Potomac Steamship Co. has been incorporated with capital of $500,000 to conduct a passenger and freight transportation business on Chesapeake bay and Potomac river by Pipkens H. Budlong, 1425 New York avenue N. W.; John T. Granger, 1333 Connecticut avenue N. W., and George B. Chipman.

FLORIDA.

Citrus County, Fla. — Phosphate Mining, etc.—Mutual Mining Co. has been organized with $200,000 capital stock and privilege of increasing to $1,000,000 to engage in phosphate mining and naval-stores manufacturing for export. Arrangements will be made for development of 22,000 acres of phosphate lands in Citrus, Sewanee, Marion, Lafayette, Levy and Alachua counties, which company owns, installing two phosphate plants, a third to be built during the summer. It is estimated that the output will be 30,000 to 40,000 tons of phosphate annually; main office, Savannah, Ga. George F. Armstrong of Savannah, Ga., is president; John R. Williams of Florida, vice-president, and Robert W. Groves of Savannah, Ga., secretary-treasurer.

Jacksonville, Fla. — Automobile Plant. — Southern Automobile Manufacturing Co. has been incorporated with $50,000 capital stock to manufacture automobiles, automobile fixtures, machinery and supplies, etc. Hubert G. Stone is president; Hugh Partridge, vice-president, and C. D. Abbott, secretary and treasurer.

St. Petersburg, Fla.—Steam Laundry.—St. Petersburg Steam Laundry has been organized with S. R. Pyles, president, and James S. Norton, treasurer and manager, to operate steam laundry. A building 32x80 feet will be erected. About $8000 will be expended in building and equipment. (Referred to December 27.)

GEORGIA.

Adairsville, Ga. — Brick Works. — Georgia Brick Co., reported organized last week, will establish plant with a daily capacity of 25,000 bricks; capital stock $20,000. Henry M. Veach is president; Dr. J. P. Bowdoin, vice-president, and R. L. McCollum, secretary-treasurer.

Buena Vista, Ga.—Water-works.—City is reported as asking bids for the best method of developing water supply; well 245 feet deep. S. N. Rushin is Mayor.*

Clarksville, Ga. — Street Improvements. — City has voted affirmatively the issuance of $4000 of bonds for macadamizing Main street. Address The Mayor.

Columbus, Ga. — Steel Bridge. — Reported that the erection of a steel bridge across the Chattahoochee river, replacing present wooden structure, has been recommended. W. C. Campbell is Superintendent of Public Works.

Columbus, Ga.—Cotton Mill.—Swift Spinning Mills, reported incorporated recently, has organized with E. W. Swift, president; Clifford J. Swift, vice-president and general manager, and J. P. Kyle, secretary-treasurer. As lately stated, company will build 10,000-spindle plant; main structure to be three stories high, 134x178 feet; Messrs. C. R. Makepeace & Co., Providence, R. I., architects in charge; capital stock of company, $125,000.

Cordele, Ga.—Water-works and Sewerage System.—City will shortly arrange to begin work on the extension of water-works and sewerage system, for which $45,000 of bonds were recently voted. Address The Mayor.

Gainesville, Ga. — Printery. — Gainesville Publishing Co., reported incorporated last week with $10,000 capital stock, will publish a weekly newspaper. A two-story brick building will be erected. Address P. O. Box 271.*

Lithonia, Ga.—Water-power Electric Plant. Georgia Granite Co. has purchased the Baker shoals on Yellow river, which will be developed and an electric plant installed for transmitting the power obtained by electricity, operating the company's quarry and railroad from Rock Chapel Mountain to Lithonia. Power will also be available for manufacturing enterprises.

Macon, Ga.—Lumber Company.—Ross-McCullough Lumber Co. has been incorporated with $5000 capital stock by M. N. McCullough, M. N. Newberry and others.

Pelham, Ga.—Electric-light Plant, Water-works and Sewerage System.—H. S. Jaudon of Savannah, Ga., and Ludwig & Co., Atlanta, Ga., have been selected as consulting engineers on the electric-light plant, water-works, sewerage and ice plant to be constructed by the city. (Referred to November 8.)

Savannah, Ga. — Contracting Company. — Gadsden Contracting Co. has been incorporated with $5000 capital stock and privilege of increasing to $100,000 by George M. Gadsden and James M. Dixon.

Savannah, Ga.—Packing Plant.—Swift & Co. (main office, Chicago, Ill.), is completing arrangements for the erection of proposed packing plant at 309 West Broad street; brick, three stories, 60x120 feet, and contain six smokehouses, which will take up the greater part of the second floor. Cement floors will be laid and the basement will be provided with sanitary suction sewers to carry off the refuse. The company will have its own refrigerating plant. (Previously referred to.)

Savannah, Ga.—Railroad Repair Shops.—Reported that the Atlantic Coast Line Railway is completing arrangements for the erection of shops at Southover, near Savannah. E. B. Pleasants, Wilmington, N. C., is chief engineer.

Valdosta, Ga. — Lumber Plant. — Incorporated: Ravenel-Gabbett Lumber Co., with capital stock of $18,000, to manufacture pine lumber and handles. S. D. Ravenel, president and manager; Cecil Gabbett, vice-president and secretary.

Wrightsville, Ga. — Water-works. — Arthur Pew, Atlanta, Ga., has been selected as engineer in charge of the construction of proposed water-works.

KENTUCKY.

Ashland, Ky.—Coal Mines.—J. W. M. Stewart, B. E. Whitman, James G. Serey and John M. Hopkins have incorporated the Camden-Mayo Coal Co. with $1,000,000 capital stock to mine coal.

Beaver Dam, Ky.—Planing Mill.—Beaver Dam Planing Mill Co. has been incorporated with $150,000 capital stock by C. M. and H. D. Taylor of Beaver Dam and A. C. Taylor of Central City, Ky.

Breathitt County, Kentucky.—Coal Mines.—Imperial Coal Co. has incorporated with $50,000 capital stock to mine coal in Breathitt

county; incorporators, Henry C. Thompson of Winchester, Ky.; J. Y. Conn of Newport, Ky.; S. G. Ward of Cincinnati, Ohio, and John Magee of Lancaster, Ky.

Dixon, Ky. — Coal Mines. — Incorporated: Diamond Coal Co. has been incorporated with $20,000 capital stock by R. L. Jackson and R. M. Baker of Dixon and J. E. and S. D. Palmer of Providence, Ky.

Hardinsburg, Ky.—Cannery.—Hardinsburg Canning Co. has been organized to establish fruit and tomato cannery having a capacity of 8000 to 10,000 cans. W. S. Ball is secretary and general manager. (Referred to November 29.)

Jeffrey, Ky. — Telephone System. — Peters Creek Telephone Co. has been incorporated by W. H. Smith, P. L. Samson and James Moore.

Kentucky, Ky. — Coal Mines. — Carnegie Peerless Coal Co. has been chartered with $10,000 capital stock by W. B. Ehrenburg, Roy Hildebrand, Roy Benjamin, Will Fagan and M. E. Starkey, all of Clarksburg, W. Va.

Knott County, Ky.—Coal and Timber Land. Reported that Campbell Slemp, through his agent, George W. Kelley of Pine Top, Ky., has purchased 7000 acres of coal and timber lands in Knott county and proposes to organize a company to develop this tract in conjunction with 20,000 acres of coal lands in Knott county recently purchased.

Louisville, Ky.—Paint Company.—Chartered: J. F. Kurfees Paint Co., with $50,000 capital stock, by James F. Kurfees, Clifton Tatum and William L. Craft.

Louisville, Ky. — Telegraph System. — Reported that the Western Union Telegraph Co. will expend several hundred thousand dollars making extensions and improving service between Louisville and adjacent cities. Charles Smith is local manager.

Louisville, Ky.—E. L. Hughes, T. R. Brown and W. W. Jett, Jr., of Louisville and A. D. Jett of Frankfort, Ky., have incorporated the E. L. Hughes Company with $100,000 capital stock.

Louisville, Ky.—Creameries Produce.—Chartered: United Creameries Produce Co., with $25,000 capital stock, by Charles A. Grant, Henry J. Tilford, Robert J. Tilford.

Louisville, Ky.—Fruit and Dairy Farm.—George W. Jones, G. C. Jones, Sam P. Jones, Charles W. Jones and associates have incorporated the Jones Bros. Fruit & Dairy Farm with $30,000 capital stock.

Louisville, Ky.—Incorporated: Altsheler & Co., with $150,000 authorized capital stock, by Daniel Altsheler, Joseph A. Altsheler and Edward L. Altsheler.

Louisville, Ky. — Power Plant. — Kentucky Electric Co., Donald McDonald, president, has purchased site on which to locate proposed electric-power plant. It is estimated that between 10,000,000 and 12,000,000 gallons of water daily will be used to operate the machinery.

Louisville, Ky. — Baking-powder Plant. — Wright Home-Made Baking Powder Co. has been incorporated with $10,000 capital stock by Jessie M. Wright, Ella B. Snively, Etta Hast Hays and Effie Lee Duncan.

Marion, Ky.—Lead and Zinc Mines, etc.—Nine-Acre Mining Co. is being organized and will be capitalized at $100,000 for the development of 150 acres of lead and zinc lands in Crittendon county. It is proposed to sink shaft, which is now 100 feet deep, down on a fissure vein at least 100 feet deeper before putting in a concentrating plant of 50 tons capacity daily. The steam plant will be enlarged, adding to it air-compressors and pneumatic drills, etc. Blue & Nunn are promoting the enterprise and will be the holding company. (Referred to December 20.)

Marion, Ky. — Lead, Zinc and Fluorspar Mines.—H. D. Drescher of Marion, John Drescher of Louisville, Ky., and associates have secured from the Columbia Mining Co. a sublease on 375 acres of lead, zinc and fluorspar-bearing property. A shaft nearly 200 feet deep has been sunk where the concentrating mill has been erected, and development work will begin at once. It is stated that the Messrs. Drescher will put in air-compressors and machinery for concentrating the ores and make other improvements preparatory to operating mine on a larger scale than heretofore.

Maysville, Ky.—Pulley Works.—Ohio Valley Pulley Works, reported incorporated December 27 with $50,000 capital stock, is an extension of an old charter. The company manufactures wood-split pulleys. Thomas A. Keith is president; S. P. Browning, vice-president, and Edw. P. Browning, secretary-treasurer.

Middlesboro, Ky.—Incorporated: R. Hayland & Co., with $10,000 capital stock, by R. Hayland, A. M. Hayland and G. W. Albrecht.

Spottsville, Ky.—Coal Mines.—Green River Coal Co., reported December 27 as increasing capital stock from $100,000 to $125,000, has about completed improvements at mines which include new equipment both inside and outside, new tipple and head frame, automatic cages, new boilers, 100-kilowatt electric generator with engine, relaying mine throughout with 16 and 20-pound rail, and installing electric haulage. Equipment for loading to the river will be installed next spring and summer. The company owns 4000 acres, containing two veins. B. C. Hubbard designed and superintended the improvements. William Clendaniel is president and R. L. Biddle secretary, both of Donora, Pa. Business office at 420 Upper street, Evansville, Ind.

West Point, Ky. — Bridge Construction. — Louisville (Ky.) Bridge & Iron Co., it is reported, has contract to reconstruct drawbridge over the Salt river for the Louisville, Henderson & St. Louis Railway; L. M. Cox, Louisville, Ky., chief engineer. The bridge will be 19 feet wide and 340 feet long. It was destroyed by flood and mentioned November 29 to be rebuilt.

Williamsburg, Ky. — Land Improvement. — Gatliff Land Co. has been incorporated with $50,000 capital stock by A. Gatliff of Middlesboro, M. H. Smith, W. L. Mapother and J. H. Ellis of **Louisville, Ky.**

Winchester, Ky.—Lumber Company.—Otter Creek Lumber Co. has been incorporated with $20,000 capital stock by R. P. Scobee, R. **M. Scobee, George J. Fallard,** all of Winchester, and W. F. Fields of Iron Mound, Ky.

LOUISIANA.

Alexandria, La. — Land Improvement. — Equitable Real Estate Co., Ltd., has been chartered with A. Albert, president; C. M. Water, vice-president, and Royal Albert, secretary-treasurer.

Alexandria, La.—Lumber Company.—Chartered: Alexandria Lumber Co., with $600,000 capital stock. J. S. Crowell is president; E. R. Porter, vice-president, and W. D. Wadley, secretary-treasurer.

Algiers, La.—Furniture Factory.—Reported that a $15,000 furniture factory is contemplated. J. C. Mathews can probably give information.

Baton Rogue, La.—Bottling Works.—Baton Rouge Cocola Co. has increased capital stock from $30,000 to $100,000.

Bogalusa (not a postoffice), La.—Turpentine-extraction Plant.—Great Southern Lumber Co., which is locating a lumber town at Bogalusa, erecting sawmills, etc., is also reported as to establish a $75,000 turpentine-extraction plant to treat the refuse of the sawmills by a newly discovered steam process. Company's main offices are located in Ellicott Square, Buffalo, N. Y. (This company's development work mentioned November 15.)

Choupique, La.—Rice-land Development.—W. L. Peters of Winston, La.; George B. Zeigler of Jennings, La., and George W. Cosner of Welsh, La., who are developing a rice plantation on Bayou Choupique aggregating 2160 acres, have under construction four houses and are arranging to build a warehouse 100x200 feet. An irrigation canal with a capacity for watering from 8000 to 10,000 acres of land is also under construction.

Harvey, La.—Lock Improvements.—Sealed proposals will be received by the Harvey Canal, Land & Improvement Co. (office opposite head of Louisiana avenue) up to 12 o'clock noon Tuesday, January 2, 1907, for the construction of a pile bulkhead approach at and the excavation of the entrance to the Harvey lock. Bond required, $500; deposit, $100. For bidders' blanks and other information call at the office of the company or at 402 Cotton Exchange Building. The right is reserved to reject any or all bids. H. P. Dart is president, and H. H. Harvey, secretary.

Lake Charles, La.—Sewerage Plant.—It is reported that the city will build a sewerage-disposal plant. Address The Mayor.

Lake Charles, La.—Ice, Light and Water Plant.—Lake Charles Ice, Light & Water-Works Co. has increased capital stock from $100,000 to $150,000.

Lewis, La. — Lumber Company.—Anderson Lumber Co. has been incorporated with $25,000 capital stock. F. W. Offenhauser is president; F. S. Anderson, vice-president; R. Randal, secretary, and H. F. Offenhauser, treasurer.

Morgan City, La. — Ship Channel. — The Atchafalaya Bay Ship Channel Co., of which E. A. Pharr is manager and C. A. Bibbins secretary, has completed the survey and has blueprints and specifications ready for receiving bids for dredging a channel 100 feet wide, 15 feet deep and about 11 miles long. Its purpose is to push the work through at an early date.

New Orleans, La.—Packing Plant.—Cudahy Packing Co. of Louisiana, Ltd., 330 Arcade place, will increase capital stock to $100,000. Edwin T. Merrick is secretary.

New Orleans, La.—Cotton Mills.—The Lane-Maginnis Mills Corporation has increased its capital stock from $1,600,000 to $2,000,000 and will organize a new corporation (probably to be entitled the Textile Mills Corporation) to operate the Lane Mills, the Maginnis Mills and the Wesson Mills of Wesson, Miss., purchased last week. Stockholders will meet on January 8 to elect new officers and directors and choose title. Total spindles to be operated 110,000; total looms 3300. S. Odenheimer is president. (See item under Wesson, Miss.)

New Orleans, La.—Drug Company.—Chartered: Acme Association, Ltd., with $100,000 capital stock. A. S. Folse is president; R. E. de los Reyes, vice-president; L. U. Folse, treasurer, and Joseph U. Folse, secretary.

Port Allan, La.—Roundhouses, Terminals, etc.—Kenefick, Hammond & Quigley Construction Co., Beaumont, Texas, has contract for the erection of incline for the ferry across the Mississippi river into Baton Rouge, also for roundhouses, shops, yards and terminals for the Colorado Southern, New Orleans & Pacific Railroad. The same company also has contract for building roundhouses, shops, etc., at De Quincy for the railroad company; the main building at the latter place to be 60x100 feet.

Shreveport, La. — Oil Wells. — Chartered: Pine Island Oil Co., with John Young, president; H. R. Hughes, vice-president, and S. S. Brady, secretary-treasurer.

Shreveport, La.—Railroad Repair Shops, etc.—Reported that the Shreveport & Northeastern Railway has purchased site on which to erect shops and general office buildings. O. K. Clingman of Homer, La., is president.

Zachary, La.—Canal Construction.—M. P. Robertson of the State Board of Engineers, Baton Rouge, La., will arrange at once to begin preliminary surveys of the canal to be built by the White Bayou Drainage District, which will begin at Zachary and run in a southeasterly direction for a distance of 11 miles. When completed the canal will open up for cultivation thousands of acres of farming lands.

MARYLAND.

Baltimore, Md. — Newspaper Plant. — The Journal Company, proprietor the Baltimore Journal, 1011-1013 East Baltimore street, has awarded contract to Henry Pierson, 1009 Hanover street, for the construction of newspaper plant at 413 East Fayette street; three stories, 18x95 feet; brick with stone trimmings; fireproof construction; electric wiring and fixtures; sanitary plumbing; heating system.

Garrett County, Md.—Coal Mines.—Reported that W. Moore Wharton of Philadelphia, Pa., has purchased 350 acres of coal land in Garrett county at $24 an acre.

Midland, Md. — Electric-light Plant.—William F. Broderick, A. A. Davis and others will organize a company to establish an electric-light plant.

Towson, Md.—Quarrying.—Conway Quarry Co. has been incorporated with $8000 capital stock by John C. Conway, Thomas W. Kennedy, Coleman McCue, H. Marcus Dennison and George M. McGreevy.

Westernport, Md.—Coal Mining.—James A. Welsh and Thomas Maloy have secured control of 360 acres of coal lands near Westernport. Coal is now being mined from the tract, the daily output being 60 tons, and operations will be continued.

Williamsport, Md.—Water-works.—Alexander Neill, Sr., V. M. Cushwa and others will submit to the Town Council a proposition asking a franchise to construct water-works; the proposition to include the erection of reservoir on hills north of town to be fed by a spring, and the construction of pipe line.

MISSISSIPPI.

Belzoni, Miss.—Sawmills. — Belgrade Lumber Co. has been incorporated at Memphis, Tenn., with $100,000 capital stock to take over, consolidate and operate on an enlarged scale the plants of Thompson & McClure and Crenshaw & Cathey. W. I. Crenshaw is president; A. N. Thompson, vice-president; John W. McClure, secretary-treasurer, and T. M. Cathey, general manager; main office, Memphis, Tenn.

Hattiesburg, Miss. — Lumber Company. — Fain-Fagin Lumber Co. has been incorporated with $30,000 capital stock by E. L. McGowan of Hattiesburg; H. N. Fagin of Mississippi City, Miss., and J. H. Fain of New Orleans, La.

Hattiesburg, Miss.—Woodworking Plant.—Lewis Lumber & Manufacturing Co. will rebuild plant reported burned December 20. Building to be 54x100 feet, with galvanized iron sides and roof; daily capacity two carloads long-leaf yellow pine telephone, electric light and street railway crossarms, creosoted crossarms, etc.; about $7000 will be invested in buildings and equipment.*

Jackson, Miss. — Candy Factory. — Fulmer-Jennings Company has been incorporated with $30,000 capital stock by B. I. Fulmer of Jackson; J. J. Longinotti and Zack E. Jennings, both of Water Valley, Miss. The company has begun the erection of a $10,000 building, a portion of which will be utilized for the manufacture of candy.

Natchez, Miss.—Reservoir. — Krumbhaar & Aiken, 201 Denegre Building, New Orleans, La., have charge of the construction of 150,000-gallon wooden reservoir, with all necessary piping, reported December 27 to be built.

Newton, Miss. — Water-works. — City will vote January 15, 1907, on the issuance of $50,000 of bonds for the construction of water-works. Address The Mayor.

Osyka, Miss. — Supply Company. — G. C. Nesmith, Jas. W. Simmons, Chas. P. Wall and Ed T. Wall have incorporated the Osyka Supply Co. with $25,000 capital stock.

Purvis, Miss.—Lumber Mill. — Chartered: Industrial Land & Manufacturing Co. with $40,000 capital stock by J. B. Perry and others.

Wesson, Miss.—Cotton Mills.—The Lane-Maginnis Mills Corporation of New Orleans, La., has purchased the New Mississippi Mills, reported organized last week, and will operate the plant in connection with its two cotton factories at New Orleans, forming a new corporation for the purpose. (See item under New Orleans.)

MISSOURI.

Carthage, Mo.—Zinc Mining and Smelting.—Cathedral Mining & Smelting Co., reported incorporated last week to develop zinc properties near Carthage, will construct five 300-ton zinc concentrating mills. About $150,000 will be expended in buildings and equipment. Construction work is in charge of James P. Newell, vice-president and general manager. All contracts have been let; main office, 74 Broadway, New York.

Centralia, Mo.—Water-works.—City is reported to vote on bond issue to construct water-works. Address The Mayor.

De Soto, Mo.—Gas Plant.—City has ratified by vote the action of council in granting franchise recently to Charles A. Magee of St. Louis for construction of gas plant for fuel and lighting purposes.

Joplin, Mo.—Cement Plant.—Incorporated: Joplin Cement Co. with $6000 capital stock by William B. Meyers, Arch McDonald, Charles McDonald and A. G. McDonald.

Kansas City, Mo. — Lumber Company. — Scott-Harrison Lumber Co. has been incorporated with $30,000 capital stock by W. S. Dickason, J. F. Goodman and J. Scott Harrison, Jr.

Kansas City, Mo.—Elevator Plant.—I. G. Hedrick, Keith & Perry Building, is engineer in charge of the construction of elevator plant to be built by the Kansas City Viaduct & Terminal Railway Co. at a cost of $3,500,000. (Referred to December 27.)

Neosho, Mo.—Water-works.—City has voted affirmatively the issuance of $40,000 of bonds for the construction of water-works. Address The Mayor.

Ozark, Mo.—Lumber and Hardware.—H. V. Reid, S. Chapman, D. F. Hedgepath and others have incorporated the Ozark Lumber & Hardware Co. with $10,000 capital stock.

Panama, Mo. — Coal Company. — Richard Lowe, Frank Lowe and Charles Shilling have incorporated the Carbon Coal Co. with $2000 capital stock.

Plattsburg, Mo.—Water-works. — Contracts for the various supplies for the construction of proposed water-works have been awarded. George Cadogan, 808 Royal Insurance Building, Chicago, Ill., is engineer in charge.

St. Louis, Mo.—Bridge Construction.—St. Louis Municipal Bridge and Terminal Commission is reported as considering plans for the improvement of the east approach to the Eads bridge by constructing a wagon viaduct with laterals leading to all the railroad freight houses on the island.

St. Louis, Mo.—Street Paving.—Reported that the Granite Bituminous Paving Co., Equitable Building, has contract for 42,429 square yards of bitulithic pavement.

St. Louis, Mo. — Cigar Boxes. — American Cigar Box Co. has been incorporated with $100,000 capital stock by Eugene H. Michel, Alexander Malcolm, Julian H. Rivers, August H. Weidman and James H. Cranfill.

St. Louis, Mo. — Amusement Company. — American Amusement Co. has been incorpo-

rated with $20,000 capital stock by S. N. Oppenheimer, Richard Spamer and J. Rich.

St. Louis, Mo.—Contracting Company.—S. R. H. Robinson, F. A. Robinson, George V. Reynolds and Edgar R. Rombauer have incorporated the S. R. H. Robinson & Son Contracting Co. with $250,000 capital stock.

St. Louis, Mo.—Land Improvement.—Incorporated: Barton Realty Co. with $20,000 capital stock by Nelson C. Chapman, Harry R. Swarts and Philip Steber.

St. Louis, Mo.—Realty and Construction Company.—Chartered: Thistle Realty & Construction Co. with $10,000 capital stock by Thomas H. Scotland, Andrew Westland, Wm. G. Ure, David S. Swan and associates.

St. Louis, Mo.—Water Patents.—John F. Wixford, James A. Carr, George L. Neuhoff and others have incorporated the Wixford Water Patents Co.

St. Louis, Mo.—Land Improvement.—Frank S. Parker, Burton McGinnis, H. N. Parker and others have incorporated the Frank S. Parker Real Estate & Investment Co. with $15,000 capital stock.

St. Louis, Mo.—Toilet Preparations.—Dr. Stearn's Dermatological Co. has incorporated with $2500 capital stock to manufacture toilet preparations; incorporators, Dr. L. A. Stearn, Thomas P. Nichols and S. R. Hunter.

Webb City, Mo.—Sewerage System.—Contract will be let January 7 for furnishing material and constructing sewer in District 16. W. E. Smith is City Engineer.*

NORTH CAROLINA.

Asheville, N. C.—Paving.—Atlantic Bitulithic Co., Spartanburg, S. C., has contract for laying 6500 square yards of bitulithic.

Ashpole, N. C. — Furniture Factory. — The Ashpole Furniture Co. has been incorporated with $25,000 capital stock by D. G. Rouse, W. T. Mercer, Worth Floyd and E. H. Rouse.

Cardenas, N. C.—Telephone System.—Chartered: Cardenas Telephone Co. with Dr. J. M. Judd of Cardenas, president; A. C. Burt of Holly Springs, N. C., vice-president; E. H. Ballentine of Walthal, N. C., secretary-treasurer.

Franklin, N. C.—Publishing.—T. B. Higden, Jr., and others have incorporated the Franklin Press Publishing Co. with $3000 capital stock.

Hemp, N. C.—Mining.—Incorporated: Dry Hollow Mining Co., with $100,000 capital stock, by George V. Copp of Hemp, Robert L. Burns of Carthage, N. C., and others.

Kitchen, N. C. — Sawmills and Timber Lands.—Kitchen Lumber Co., reported incorporated last week with capital stock of $100,000, will build two complete eight-foot band mills, one small six-foot portable band mill, and build tramways. Company has purchased 25,000 acres of timber lands for development in Swain and Graham counties, and will manufacture 100,000 feet of lumber daily. It will not begin active work until railway is completed. Charles Kitchen, president; R. H. Vansant, vice-president, and John W. Kitchen, treasurer; located at Leon, Ky., where correspondence should be addressed until further notice.*

Lenoir, N. C.—Furniture Company.—United States Furniture Co. has been incorporated with $125,000 authorized capital stock by J. M. Chiles of Lenoir, Charles A. Haitt of Manchester, N. H., and Elmer H. Gray of Boston, Mass.

Mayodan, N. C.—Supply Company.—Mayodan Supply Co. has been incorporated with an authorized capital stock of $10,000 by Francis B. Kemp, C. P. Baughan, J. E. Dempster, J. L. Matthews, C. L. Smith, Thos. W. Ault.

Raleigh, N. C.—Telephone System.—At a meeting of the directors of the Capital City Telephone Co. the properties of the Interstate Telephone Co. and the Southern Bell Telephone Co., recently purchased, were formally taken over. Arrangements will be made for improving the entire system, extending underground conduits and erecting new exchange with a capacity of 1500 telephones, for which plans have been prepared. W. T. Gentry of Atlanta, Ga., is president of the company; L. A. Carr of Durham, N. C., vice-president; Hunt Chipley of Atlanta, Ga., secretary, and D. I. Carson, treasurer. (Referred to last week.)

Rocky Mount, N. C. — Bottling Works. — Rocky Mount Pepsi-Cola Bottling Co. has been chartered with $50,000 capital stock by J. D. Farrier, Geo. L. Morgan, F. P. Rawlings and J. M. Pearson.

Town Creek, N. C.—Timber and Trucking Lands.—Town Creek Railroad & Lumber Co., recently organized with R. F. De Vane of Red Springs, N. C., president; A. J. McKinnon of Maxton, N. C., vice-president, and Z. W. Whitehead of Wilmington, N. C., secretary-treasurer, will begin the development of timber and trucking lands which it owns in Brunswick county. The company's holdings are said to consist of 100,000,000 feet of pine and cypress timber, besides about 25,000,000 to 30,000,000 feet of hardwood. A large double-decked sawmill with a daily capacity of 30,000 feet, planing mills, dry-kilns, shingle mills are now in operation.

Wilmington, N. C. — Packing Plant. — Armour Packing Co., Chicago, Ill., it is reported, has secured option on site on which it is proposed to erect a $25,000 plant. Greene Fenley is local manager.

Wilmington, N. C.—Naval Stores.—American Naval Stores Co. has been incorporated with $1,500,000 capital stock by S. P. Shotter, E. S. Nash, J. F. C. Myers of Savannah, Ga., and George M. Boardman of Flatbush, N. Y.

SOUTH CAROLINA.

Calhoun Falls, S. C.—Water-power Electrical Plant.—Incorporated: The Calhoun Falls Company, with capital stock of $280,000, to develop the water-power at Calhoun Falls, where from 30,000 to 40,000 horse-power will be obtained for transmission by electricity. Viele, Cooper & Blackwell, 40 Wall street, New York, are making the preliminary surveys, and it is proposed to arrange for the construction to be begun in the near future and pushed to completion as rapidly as possible. Patrick Calhoun, 30 Broad street, New York, will be chairman of the new company's board of directors. No engineer in charge has been engaged as yet. Messrs. Hugh MacRae & Co., Colorado Building, Washington, D. C., and Wilmington, N. C., will finance the enterprise and construct the plant. Inquiries for information are to be addressed to them. The company has elected Patrick Calhoun, president; Augustine T. Smythe, vice-president, and H. F. Gaus, secreary-treasurer, all of Charleston, S. C.

Camden, S. C.—Gold Mine.—Dr. George F. Lee of Philadelphia, Pa., it is reported, has leased a tract of 20 acres on Suanee creek containing gold deposits, and is arranging to open a mine.

Charleston, S. C.—Cotton Pickery.—It is proposed to organize company to establish a cotton pickery. Possibly George Lunz can give information.

Charleston, S. C.—Electrical Company.—Chartered: Citizens' Electrical Co. with $7000 capital stock by H. M. Franks and D. S. Lewis.

Columbia, S. C.—Telephone System.—Columbia Rural Telephone Co. has been incorporated with $1000 capital stock. J. B. S. Lyles is president, and E. L. Craig, secretary-treasurer.

Gaffney, S. C.—Cotton-stalk-fiber Machines. Cotton Stalk Fiber Machine Co. is being organized by J. L. Daniels and associates to manufacture machinery to produce fiber and pulp from the stalks of the cotton plant. No decision has been made as to size and cost of buildings to be erected, etc. (Referred to December 27.)

Sumter, S. C.—Lumber Company.—Linson Lumber Co. has been incorporated with $30,000 capital stock by W. B. McLaughlin and others.

Ulmers, S. C.—Lumber Company.—Boothe Lumber Co. has been incorporated with $10,000 capital stock. R. I. Manning is president and George P. Boothe secretary and treasurer.

TENNESSEE.

Crandull, Tenn.—Sawmill.—C. N. Pile will re-establish plant reported burned; daily capacity to be 20,000 feet.

Jackson, Tenn. — Woolen Mill. — Reported the Jackson Woolen Mills will increase capital stock from $60,000 to $100,000. This company is now rebuilding plant previously destroyed by fire.

Knoxville, Tenn.—Paving.—Southern Bitulithic Co. of Nashville, Tenn., has contract at $120,000, and the Southern Paving & Construction Co. of Chattanooga, Tenn., at $180,000 for proposed street paving.

Knoxville, Tenn.—Construction Company.—Chartered: Kreis-French Construction Co., with $20,000 capital stock, by S. F. Kreis, J. A. Kreis, C. M. French, J. A. Frazier and R. D. Kreis.

Memphis, Tenn.—Coffin Factory.—Bluff City Coffin Co., reported incorporated December 27 with $30,000 capital stock, has secured building and purchased equipment; will probably begin operations February 1.

Nashville, Tenn.—Publishing.—A company will be incorporated with capital stock of $100,000 to take over and publish in one form the Bob Taylor Magazine and Trotwood's Monthly under the title of the Taylor-Trotwood Magazine; Robert L. Taylor, John Trotwood Moore, A. P. Foster, D. F. Wallace, Jr., and others, incorporators. Messrs. Wallace and Foster will be managers.

Nashville, Tenn.—Woodworking Machinery. Estes Machine Co. has incorporated with $5000 capital stock to manufacture woodworking machinery, such as saws and sawmills. Company will be located at 216 Public Square; incorporators, F. L. Estes, W. H. Fickling, Frank Rives and E. S. Wright.

Nashville, Tenn.—Concrete-block Factory.—Chartered: Foster & Creighton Company, with $100,000 capital stock, by W. F. Foster, R. T. Creighton, C. H. Brandon, R. M. Dudley and C. C. Foster, to manufacture concrete and all kinds of building work.

New Market, Tenn.—Zinc Mines.—The New Market Zinc Co., lately mentioned by error under Jeffersonville, Tenn., is chartered under New Jersey laws. It is located at New Market, is now developing its zinc properties, and proposes to undertake the installation of modern plants. This company is not connected with any company of similar name heretofore operating in this district. John H. Bartlett is superintendent in charge. Charles Westerberg is president, and Geo. P. Janes, secretary.

Parsons, Tenn.—Electric-light Plant.—Reported that the Parsons Marble and Granite Works will install electric-light plant for lighting the town.

Trezevant, Tenn.—Water-works.—Ware & Harris contemplate constructing water-works to cost $1500.

TEXAS.

Alvin, Texas—Creamery.—It is reported that M. Mortensen of Rock Island, Texas, will establish creamery in Alvin.

Atlanta, Texas—Oil Wells.—F. M. Green, H. A. O'Neal, L. W. Willis of Atlanta, A. H. Shipes of Douglasville, Texas, and John S. Hutchins of Quinby, Texas, have incorporated the Sulphur Oil Co. with $500,000 capital stock.

Austin, Texas—Land Company.—Wildbahn Land Co. has been incorporated with $10,000 capital stock by John K. Donnan, B. M. Thomson of Austin and J. E. Wildbahn of Denver, Col.

Beaumont, Texas — Oil Wells.—Incorporated: Cassie Oil Co. with $10,000 capital stock by E. C. Ogden, J. C. Wilson and G. L. Adsit.

Brady, Texas—Oil Mill.—Brady Oil Mill has been incorporated with $75,000 capital stock by Winfield Scott, W. D. Crothers, E. B. Harrold, N. A. Perry and others.

Brownsville, Texas—Construction Company. Samuel A. Robertson, Thomas Moore and William R. Lewis have incorporated the Rio Grande Construction Co. with $10,000 capital stock.

Dallas, Texas—Land Improvements.—Flippen-Prather Realty Co., lately reported incorporated with capital stock of $75,000, will develop 1400 acres of suburban lands. It contemplates building in the future an electric-light plant, water-works and septic tank.

Dallas, Texas—Sash, Door and Blind Factory.—Moore & Co. will erect a $20,000 brick building to be equipped as sash, door and blind factory. Lang & Winchell prepared the plans and specifications. Kenyon & Co. have contract for its erection.

Decatur, Texas—Milling Company.—Lillard Milling Co. has been incorporated with $100,000 capital stock by N. W. Dunham, J. S. Rice, W. M. Rice, G. W. Norrell and P. S. Tilson.

Denison, Texas — Subway. — Reported that the Missouri, Kansas & Texas Railway is considering the construction of a subway on Crawford street under the yards. S. B. Fisher, St. Louis, Mo., is chief engineer.

Denison, Texas — Dairy Farm. — The dairy farm reported December 20 to be established near Denison will be operated under the direction of the Agricultural and Mechanical College of Texas in co-operation with the United States Department of Agriculture. The buildings and general arrangements will be under the direction of the various divisions of the Department of Agriculture. All buildings will be of ordinary construction and cost about $5000; management of H. N. Slater, a Government dairy expert.

Eagle Pass, Texas—Coal Mines.—International Coal Mines Co., it is reported, has purchased at $65,000 the Olmos coal mines located in Maverick county. Marshall Hicks of San Antonio, Texas, is president of the company.

Gonzales, Texas — Bottling Works, etc. — Emil Schleyer, proprietor of the Gonzales Bottling Works, will enlarge plant and install additional machinery, including equipment for the manufacture of ice-cream.

Gonzales, Texas — Ice and Refrigerating Plant.—Gonzales Ice & Refrigerating Co. has been incorporated with $20,000 capital stock by W. P. Fisher, J. H. Boothe, B. N. Peck, W. J. Bright and T. H. Spooner.

Hamlin, Texas—Townsite Company.—R. D. Moore, W. S. Whaley, T. S. Whiteley, J. M. Cunningham and Ed S. Hughes have incorporated the Hamlin Townsite Co. with $12,000 capital stock.

Houston, Texas — Steamboat Company. — Brazos River Navigation Co. is the title of company reported November 15 as organized with J. B. Baker of Waco, Texas, president; C. B. Kitchell of Galveston, Texas, secretary, and J. H. P. Davis of Richmond, Texas, treasurer, to operate passenger and freight steamers on the Brazos river; capital stock $50,000.

Houston, Texas — Real Estate. — American Land & Immigration Co., offices in the Mason Building, has been organized by W. T. O'Connor, general manager; J. W. Oman, city department manager; C. Carrington, Dr. J. O. Howard and E. H. Lane.

New Braunfels, Texas—Water-works.—City has voted affirmatively the issuance of bonds for the purchase of the Klingemann Springs to furnish the city with water. Address The Mayor.

Rusk, Texas—Iron Furnace.—Rusk Iron Co has been organized with W. H. Ontley, president and general manager; Amos J. Mitchell of Beaumont, Texas, vice-president; V. W. Ricords, secretary, and John S. Wightman, treasurer, to take over and operate the Star and Crescent furnace, which is now undergoing repairs; capital stock $250,000.

San Antonio, Texas—Water-works.—Chartered: San Antonio Water Supply Co., with $2,500,000 capital stock, to take over and operate the plant of the San Antonio Water-Works Co. George J. Kobusch is president; C. H. Surcamp, vice-president, both of St. Louis, Mo.

San Antonio, Texas—Oil Wells.—Chartered: Mission Oil Co., with $100,000 capital stock, by J. T. Wilson, F. A. Piper and J. W. Groesbeck.

Sherman, Texas — Publishing.—Chartered: Courier Publishing Co., with $6500 capital stock, by Guy P. Horton, J. H. Binkley, F. C. Vaden, S. D. Moore and T. R. Crookshanks.

Sulphur Springs, Texas — Stone-crushing Plant.—Texas Stone Crushing Co., recently chartered with $15,000 capital stock, to operate stone-crushing plant, has completed organization with Dan Morgan president and R. A. Hegel vice-president and general manager, both of Dallas, Texas.

Texarkana, Texas — Bridge Construction. — Bids for the construction of proposed bridge for Bowie county across Aiken creek will shortly be asked. B. F. Hargett is Commissioner Precinct No. 1.

Victoria, Texas—Sewerage System.—City is considering the construction of additional sewerage. Address The Mayor.

Wichita Falls, Texas — Townsite. — Red River Valley Townsite Co. has been incorporated with $40,000 capital stock by J. A. Kemp and Frank Kell of Wichita Falls and J. C. Doneghy of St. Louis, Mo.

Wylie, Texas — Printing Plant. — Clarence Urban will rebuild printing plant reported burned last week. A frame building 20x60 feet will be erected.*

VIRGINIA.

Bristol, Va.—Agricultural Implements and Supplies.—Farmers' Supply Co. has been incorporated with an authorized capital stock of $10,000. W. P. Huff is president; James D. Johnston, vice-president; L. Nininger, secretary, all of Roanoke, and F. P. Nininger of Bristol, treasurer and manager.

Falls Church, Va.—Packing Plant.—Vegetarian Meat Co. has been incorporated with $25,000 capital stock. Eugene Scheeley is president; John W. Tiffany, secretary, and F. C. Geiger, treasurer, all of Washington, D. C.

Fordwick, Va. — Portland-cement Plant. — Virginia Portland Cement Co. is arranging for making extensive improvements to plant and installing equipment for an additional capacity of 2000 barrels daily. It is also proposed to erect a new power-house, installing two turbines, increasing the boiler capacity by 1500 horse-power, aggregating 2000 horsepower. All of the machinery will be electrically driven. W. S. Barstow & Co. of New York and Portland, Ore., are consulting engineers.

Keysville, Va.—Telephone System.—Ontario Telephone Co. has been chartered with J. W. Morton, president; W. E. Hailey, vice-president; P. H. Dodson, secretary-treasurer and general manager.

Moccasin Gap, Va.—Coke Ovens and Power Plant.—Reported that the Virginia Iron, Coal & Coke Co. will shortly begin the construction of coke ovens on land recently acquired, and will erect power plant utilizing the wa-

ter power adjacent. Main office, Bristol, Tenn.

Norfolk, Va.—Land Improvement.—Tidewater Terrace Co. has been incorporated with an authorized capital stock of $100,000. Thos. J. Powell is president and George B. Crow secretary-treasurer.

Petersburg, Va.—Cigar Factory.—American Cigar Co. has awarded contract to Mankin Construction Co., Richmond, Va., for erection of factory building, three stories high with basement, 170x55 feet; mill construction; steam heating; electric-lighting fixtures; electric elevators; two boilers to be installed; cost $55,000; architect, the American Cigar Co.; main offices, 111 Fifth avenue, New York. (Recently referred to.)

Richmond, Va.—Cigar Factory.—American Cigar Co. has awarded contract to Mankin Construction Co. for erection of sweatroom, 100x40 feet, two stories high; mill construction; steam heating; electric lighting; electric elevators; two boilers to be installed; wiring for the lighting; architect, the American Cigar Co., 111 Fifth avenue, New York; cost $9328. (Recently referred to.)

Richmond, Va.—Printery and Folding-box Plant.—Incorporated: A. S. Kratz Company, with capital stock of $40,000, to operate general printery and folding-box plant; incorporators, A. C. Becker, A. S. Kratz, Jr., A. A. Kratz, Jr., H. E. Kastin, each of Richmond, and Charles E. Davis of Washington, D. C.; capacity of plant 250,000 boxes; location, 13 Governor street.*

Richmond, Va.—Hot-water Heater.—Coppridge Heater Corporation has increased capital stock from $25,000 to $50,000; office, 12 North 9th street.

Richmond, Va. — Granite Quarry. — Chartered: Sunnyside Granite Co., with H. H. George, Jr., president and Robert M. Beattie secretary-treasurer. Authorized capital stock $25,000.

Richmond, Va. — Electric-light and Pump Plant.—It is proposed to recommend to the City Council at its January meeting the issuance of $340,000 of bonds for the construction of a municipal electric-light and pumping station, in accordance with plans submitted by E. W. Trafford, electrical engineer. Charles E. Bolling is superintendent of water-works.

Rocky Mount, Va.—Furniture Factory.—Bald Knob Furniture Co. has been organized with an authorized capital stock of $50,000. N. P. Angle is president; James A. Martin, vice-president, and B. L. Angle, secretary-treasurer. (A. W. Robins was mentioned last week as promoting the enterprise, but item was erroneously reported under Rocky Mount, N. C.)*

Rosslyn, Va.—Printery.—Chartered: Sudwarth Printing Co., with $30,000 authorized capital stock. Charles F. Sudwarth is president and John B. Kinnear secretary, all of Washington, D. C.

South Boston, Va.—Electrical and Mechanical Supplies.—Incorporated: J. A. Mebane Company, with $25,000 authorized capital stock. R. S. Barbour is president and R. W. Lawson vice-president.

Staunton, Va. — Hardware. — Worthington Hardware Co. has been chartered with J. H. Worthington president and Clarke Worthington secretary-treasurer.

WEST VIRGINIA.

Burlington, W. Va.—Telephone System.—Burlington Telephone Co. has been incorporated with $6000 capital stock by Dr. F. L. Baker of Burlington, L. J. Forman of Petersburg, W. Va.; C. D. Bowman of Moorefield, W. Va., and G. P. Miller of Romney, W. Va.

Charleston, W. Va. — Sewerage System. — The proposed municipal sewerage-construction work lately referred to ($200,000 to be expended) will consist of building five or six miles of sewers, ranging from six inches diameter to eight-inch terra-cotta pipe. The larger sewers will be principally of reinforced concrete. Specifications will be completed soon, ready for the reception of proposals. T. Chalkley Hatton of Wilmington, Del., is the consulting engineer in charge.

Clarksburg, W. Va.—Coffin and Casket Factory.—F. S. Wilson, J. H. Cuppet, C. B. Cuppet of Clarksburg, Austin Brown of Oakland, Md.; L. L. Brown of Harrisville, Pa., and others have incorporated the Clarksburg Casket Co. with $25,000 capital stock.

Colebank, W. Va.—Sawmill.—John W. Shaw is rebuilding his sawmill recently referred to as destroyed by fire; will have capacity of 10,000 feet daily.

Fairmont, W. Va. — Land Improvement. — Conaway Realty Co. has been organized with $25,000 capital stock. C. E. Conaway is president; W. H. Conaway, vice-president and treasurer, and A. L. Conaway, secretary.

Grafton, W. Va. — Coal Mines. — Reported that Wiley Byers, John T. Robinson and Herbert Crawford of Uniontown, Pa., have purchased 1500 acres of coal land near Grafton.

Keyser, W. Va.—Boiler-house.—W. A. Liller has received contract at about $5000 for erection of addition to boiler-house of Western Maryland Railroad Co., which has main offices at Baltimore, Md.

Moore's Siding (not a postoffice)—Lumber Company.—Bell Lumber Co. has been incorporated with $200,000 capital stock by J. Scott Bell, S. Earle Bell, M. E. Bell, all of Elkins, W. Va.; W. W. Dempsey and Harry W. Bole of Johnstown, Pa.

Parkersburg, W. Va. — Printery. — W. M. Barnes Directory Co. has been incorporated with $25,000 capital stock by William Barnes, Alex. M. Eichman, J. Mentor Caldwell, R. H. Moon and S. F. Smoot.

INDIAN TERRITORY.

McAlester, I. T. — Machinery Steel, Supplies, etc.—A company has been organized with $50,000 capital stock and will absorb the plant of the New State Steel Co. It will deal in all sorts of steel-supply articles, and especially in heavy machinery, implements and tools. H. H. Kirkpatrick is president; W. G. Weimar, vice-president, and W. J. Schaefer, secretary-treasurer.

Muskogee, I. T.—Woodworking Plant.—National Mill & Manufacturing Co., reported incorporated December 20 with $25,000 capital stock, will manufacture lumber, sash, doors, moldings, store and office fixtures, all kinds of interior finish. A building 80x80 feet will be erected. About $11,500 will be invested in building, land and equipment. J. T. Haizlip is president.

Ravia, I. T.—Granite Quarries.—A company with a capital stock of $50,000 will be incorporated to develop granite quarries, furnishing granite for railroad ballasting, concrete work for streets and paving and building materials. L. J. Polk is president; Charles H. Moore, vice-president; N. H. Ricker, secretary-treasurer and general manager.

Tulsa, I. T. — Telephone System. — A new company being organized with $25,000 capital stock by Don Farnsworth of Chicago, Ill., and associates has applied for franchise.

Tulsa, I. T.—Oil Wells.—Santa Fe Oil Co. of Tulsa and Pawnee, O. T., has been incorporated with $40,000 capital stock by Frank B. Burford and Vena Clay of Tulsa and John R. Skinner of Pawnee.

OKLAHOMA TERRITORY.

Aline, O. T.—Oil and Gas Wells.—Incorporated: Aline Oil & Gas Co., with $500,000 capital stock, by J. A. Hartshorn, J. M. Sears, J. F. Rush, E. R. Clark and others.

Butler, O. T.—Townsite.—Butler Townsite Co. has been incorporated with $3000 capital stock by George H. Moeller, Dr. J. F. Frizzell, T. K. Winter, E. A. Olmstead, George J. Ames of Butler and T. J. Lack of Clinton, O. T.

Cleveland, O. T. — Petroleum Company. — Continental Petroleum Co. of Cleveland and Tulsa, I. T., has been incorporated with $10,000 capital stock by J. W. Sloan of Cleveland, J. H. Berry and W. S. McCluskey of Tulsa, I. T.

Cushing, O. T.—Cannery.—Cushing Canning Co. has been incorporated by L. B. Hay, L. D. Gaunt, Jacob Puckett, Robert Odor, H. T. Carver, all of Cushing; William Chesterfield of Guthrie, O. T., and O. T. Hubbell of Stroud, O. T.; capital stock $10,000.

Enid, O. T.—Development Company.—F. B. Hodgden, H. J. Sturgis and I. G. Conkling have incorporated the New State Development Co. with $20,000 captial stock.

Enid, O. T.—Publishing.—Enid Newspaper Co. has been incorporated with $10,000 capital stock by Eugene P. Moore of Enid, A. C. Fisher of Guthrie, O. T., and William P. Lifiett of Toledo, Ohio.

Guymon, O. T.—Flour Mill, Grain Elevator, Grist Mill, etc.—Reported that the Farmers' Union is considering the construction of flour mill, grain elevator, grist mill, etc.

Hobart, O. T.—Cotton Company.—W. A. Patterson of Hobart, W. F. Roberts and J. K. Patterson of St. Louis, Mo., have incorporated the Patterson Cotton Co. with $10,000 capital stock.

Lawton, O. T.—Public Improvements.—City will vote on the issuance of $20,000 sanitary sewer, $30,000 water-works, $5000 street grading, $10,000 for straightening Squaw creek, all Fifth ward; street grading original town, $10,000; sewer extending original town, $40,000; water-works and street work original town, $145,000. R. A. Jones is Mayor.

Lawton, O. T.—Fencing Contract.—J. H. Gurley of Denton, Texas, has received contract at about $15,000 for fencing game preserve in Wichita Mountains. Fence to be constructed of iron posts and forms of wire netting. It will surround an area of 12 square miles.

Okarche, O. T.—Telephone System.—Chartered: Hoebing Telephone Co., with $6000 capital stock, by T. F. Hanson, John W. Thiems of Calumet, O. T.; John Hoebing, Mat Wiemel, G. D. Lovell, Henry Frederick and Charles Thiems of Okarche.

Oklahoma City, O. T.—Grain Elevator.—Capital Grain & Elevator Co. will erect a 100,000-bushel elevator at a cost of $50,000. All contracts have been awarded. J. A. Horn is architect and engineer in charge. (Referred to December 27.)

Oklahoma City, O. T.—Publishing.—Tucker Bros. Publishing Co. has been incorporated with $5000 capital stock by Dudley R. Tucker, Howard A. Tucker and A. B. Honnold to publish the Daily Pointer.

Oklahoma City, O. T.—Sewerage System.—City Engineer Burke has prepared plans for a new sewer district, located west of Laird avenue; cost about $35,000.

Oklahoma City, O. T.—Townsite Company. Southwestern Estate Debenture & Sales Co. has been incorporated with $2,500,000 capital stock by H. H. Howard of Oklahoma City, E. A. Hill of Muskogee, I. T.; W. K. Burton, W. W. Fariss, T. H. Arnold, S. W. Tate and R. E. Hunter of Memphis, Tenn.

Pawhuska, O. T.—Oil Wells.—Graves Oil Co. has been incorporated with $40,000 capital stock by C. S. McDonald of Pawhuska and J. L. Sells and Arthur S. Hendren of Tulsa, I. T.

Sayre, O. T.—Water-works.—City has engaged Burns & McDonnell, Dwight Building, Kansas City, Mo., to prepare plans and specifications for the construction of proposed water-works.

Shawnee, O. T.—Ice Cream and Novelty Company.—Shawnee Ice Cream & Novelty Co. has been incorporated with $2500 capital stock by P. M. Martin, S. M. Martin, F. H. Hastings of Shawnee, Madge Williamson of Springfield, Mo., and others.

BURNED.

Atlanta, Ga. — Harper Bros. Company's stock barns. Ragsdale-Carlisle Horse & Mule Co.'s stock barns; total loss on buildings $20,000. Harper & Weathers' planing mill.

Clendenin, W. Va.—Young's Hotel.

Columbus, Ky.—Wright Building. Moss, Hefley & Moss' store building. Bank of Columbus damaged.

Davis, I. T.—Davis Steam Laundry; loss $3000.

Fort Ogden, Fla.—Morgan & Barnes Turpentine Co.'s plant.

Gatesville, Texas.—Boys' dormitory at the State Reformatory. L. J. Tankersley is superintendent.

Grapevine, Texas.—R. L. Newton's cotton gin.

Henrietta, Texas.—W. B. Worsham & Co.'s cotton gin and electric-light plant; loss $25,000.

Imboden, Ark.—People's Bank Building.

Knoxville, Tenn.—The Woman's Building; loss $15,000.

Lagrange, Ga.—B. G. Swanson's residence; loss $10,000.

Lexington, Ky.—Boise-Grogan Lumber Co.'s sawmill.

Madisonville, Ky.—Lucille Hotel; owned by C. C. Givens.

Marietta, Ga.—Georgia Manufacturing and Public Service Co.'s water and electric-light plant and paper mill; reported loss, $250,000.

Morgan, Texas.—Morgan Flour Mills' mill and elevator; loss $7550.

New Orleans, La. — Illinois Central Railroad Co.'s freight shed No. 6; loss $16,000. A. S. Baldwin, Chicago, Ill., is chief engineer.

Newport News, Va.—Newport News Shipbuilding & Dry Dock Co.'s shipcarpenters' shop, sheet-iron shop, sail and rigging loft, oakum loft and pipefitters' shop; reported loss about $200,000; New York offices at No. 1 Broadway.

Pretoria, Ga.—Red Cypress Lumber Co.'s dry-kiln, loading platform and lumber shed; loss $20,000.

Stevensville, Md.—Bright & Snyder's warehouse.

Valdosta, Ga.—Durant Lumber Co.'s planing mill and dry-kiln; reported loss, $12,000.

Wagoner, I. T.—F. B. Gilbert Grain Co.'s elevator; loss $6000.

Westminster, Md.—Raymond P. Bankert's laundry and overall factory; reported loss about $5000.

West Monroe, La.—Millsaps & Co.'s store building; loss $20,000.

Weston, W. Va. — Riverside Hotel; loss $5000.

Wheeling, W. Va.—Freedom Oil Co.'s plant; loss $10,000. Frank McGill is manager.

BUILDING NOTES.

* Means machinery, proposals or supplies are wanted, particulars of which will be found under head of "Machinery, Proposals and Supplies Wanted."

Abbeville, S. C.—Courthouse.—Edwards & Walter, Loan and Exchange Bank Building, Columbia, S. C., have been commissioned to prepare plans for Courthouse to be erected by Abbeville county to cost about $50,000.

Atlanta, Ga.—Clubhouse.—It is reported that the Transportation Club, offices in the Equitable Building, will erect a $65,000 clubhouse.

Atlanta, Ga.—Hospital.—Bruce, Everett & Hayes, Atlanta, Ga., have been selected as architects for the hospital building, Confederate Soldiers' Home. Bids will be asked for about the first of the year.

Atlanta, Ga.—Buildings.—Bids will be received until January 21 at the office of Haralson Bleckley, architect, 617-18-19 Empire Building, for the construction of three buildings each in nine of the congressional districts of Georgia for the industrial and agricultural schools, in accordance with drawings and specifications, copies of which may be had by applying to architect; size of larger buildings two stories, 50x140 feet; ordinary construction with outside brick walls; steam in some buildings, stoves in others; electric fixtures.

Austin, Texas—Church.—Plans have been completed for proposed $30,000 edifice for the University Methodist Church. Address The Pastor.

Baltimore, Md.—Dwellings.—E. R. Cooper, manager National Concrete Stone Co., 22 Ingram Building, Hanover and Lombard streets, will erect four three-story dwellings on Calvert street between 24th and 25th streets, to cost about $20,000; Henry J. Tinley, architect, Hoffman Building, 11 East Lexington street.

Baltimore, Md.—Bank Building.—The Mercantile Bank, 1206 West Baltimore street, has awarded contract to C. C. Watts, 113 Hamilton street, for the construction of bank building at southwest corner Baltimore street and Carrollton avenue; one story; brick with limestone trimmings; fireproof vaults; electric wiring and fixtures; sanitary plumbing; heating system; Tormey & Leach, architects, 323 North Charles street.

Baltimore, Md. — Dwellings. — Edward J. Gallagher, builder, 2808 Fairmount avenue, will erect 10 two-story brick dwellings on 27th near Oak street, to cost about $20,000; Jacob F. Gerwig, architect, Hoffman Building, 11 East Lexington street.

Baltimore, Md.—Office Building.—It is reported that John Cowan, 106 West Madison street, will be awarded contract for the construction of office building at northeast corner Water and South streets for the Johns Hopkins University; five stories, 27x52 feet; brick with granite base and stone trimmings; structural iron and steel; slag roof; electric wiring and fixtures; sanitary plumbing; steam-heating system; elevator; Wyatt & Nolting, architects, Keyser Building, German and Calvert streets.

Baltimore, Md.—Warehouses.—Frederick A. Wineke, Irvington, has awarded contract to J. H. Miller, 110 Dover street, for the reconstruction of warehouse at 20 West Camden street and building in rear into five store buildings and warehouses to face on new Light street; cost about $7000.

Baton Rouge, La.—College Buildings.—Bids will be asked at once by the Louisiana State University for the erection of building to be occupied by the department of chemistry. Plans were prepared by Favrot & Livaudais, New Orleans, La., and call for a three-story building.

Benavides, Texas—Business Building.—Jose Villo has let contract for the erection of a $20,000 brick building.

Bogalusa (not a postoffice), La.—Buildings. Great Northern Railway Co. will begin about January 20 the construction of the various buildings to be located in Bogalusa, covering a ground space of about 20 acres and representing an investment of $500,000. The buildings will include a two-story office building with construction of stucco-covered frame, cost $40,000; machine shops, roundhouse and yards, to cost $250,000, of brick and stone construction, with steel roofs and concrete foundations; employes' dwellings numbering about 200, costing $1000 each; one-story frame freight depot, 30x200 feet, cost $5000; two-story passenger depot,

24x90 feet, of brick and steel, cost $15,000. Harvey Murdock, 116 Nassau street, New York, is architect, and will superintend the construction. He has also designed a $100,000 hotel to be located in the town. This company is identified with and will operate in conjunction with the Great Southern Lumber Co., Ellicott Square, Buffalo, N. Y., which is establishing the town of Bogalusa, referred to at various times in this department, more recently in issue of November 15. American Bridge Co., Pittsburg, Pa., which has the contract for the construction of sawmill, will begin work about January 15. About 7000 tons of steel will be used in the construction of mill.

Bunkie, La.—School Buildings.—The Avoyelles Parish School Board will issue $17,500 of bonds for the erection of new county school buildings.

Charlotte, N. C. — Church. — First Baptist congregation is reported as arranging for the erection of $50,000 edifice. Address The Pastor.

Clarksburg, W. Va.—Lodge Building.—Elks Building Co. will erect lodge building for local lodge of Elks, referred to December 27; structure to be three stories, 54x82 feet; nearly fireproof; cost $40,000. Architect has not been selected. Uay Reefer is secretary.

Crowley, La.—Passenger Depots.—W. C. Whitney of Beaumont, Texas, has contract to erect passenger depots for the Colorado Southern, New Orleans & Pacific Railway Co. at Crowley and Opelousas, La., costing about $15,000 each, in accordance with plans and specifications prepared by C. H. Page of Austin, Texas. The Beaumont Brick Co. of Beaumont, Texas, has contract for the brick.

Durham, N. C.—Hospital.—Kendall, Taylor & Stevens, 93 Federal street, Boston, Mass., are preparing plans for hospital to be erected by George W. Watts and given to the city. It is proposed to erect a modern fireproof building, probably reinforced concrete; steam detached heating plant; electric fixtures; electric or water elevator; first cost to be $100,000 to $150,000, and planned to enlarge as needed.

Fort Smith, Ark.—Dwelling.—W. F. May & Co. has contract to erect $20,000 residence for W. R. Martins after plans by Parsons & Blakley; stone and brick, with tile roof.

Fort Smith, Ark.—Theater.—W. F. May & Co. have contract to erect additions to the Lyric Theater; cost $6000.

Goldsboro, N. C.—Church.—H. E. Bonitz, 15 Princess street, Wilmington, N. C., will prepare plans and specifications for edifice to be erected by St. Stephen's Episcopal Church. Rev. Mr. Horsfield is pastor.

Grafton, W. Va.—Lodge Building.—Grafton Elk Building Co. has been chartered with $50,000 capital stock by Ashby J. Wilkinson, Thomas J. McAvoy, Charles R. Durbin, Gen. F. Bailey and Simon Freedman to erect clubhouse.

Gulfport, Miss.—Jail Building.—City is reported as to erect jail building, for which plans and specifications have been ordered. Address The Mayor.

Gulfport, Miss.—Jail Building.—City will have plans prepared for new jail building. Address The Mayor.

Hagerstown, Md.—Apartment-house.—J. C. Roulette states there is no truth in the report mentioned December 20 that he will erect an apartment-house.

Hampton, Va.—Hotel.—Hampton Hotel Co. has been incorporated with $25,000 authorized capital stock to erect hotel. J. W. Rowe is president and treasurer, and Segar Whiting, secretary.

Henderson, Ky.—Store Building.—Walter Brashear has prepared plans for three-story building 40x150 feet, to be erected by Norris & Lockett Company. (Company reported last week as increasing capital stock from $12,000 to $25,000.)

Hillsboro, Texas—School.—The $20,000 school bonds recently voted have been approved by the Attorney-General, and as soon as plans and specifications can be completed the School Board will ask for bids for the erection of a $17,000 high-school building. Site has been purchased. (Previously reported.)

Hillsboro, Texas—Store Building.—A. E. Graham has awarded contract to Tom Sowell for erecting a brick store building on site of one recently burned. Building will be 100 feet front by 120 feet deep; double-decked, with 21-foot ceiling; plate-glass front; contract price $15,000.

Jackson, Miss. — Hotel. — Joel F. Johnson has definitely decided to build his proposed hotel; structure to be eight stories high, with basement, 71x80 feet; fireproof construction; steam-heating plant; electric-lighting fixtures; elevators; architect, R. H. Hunt; contractor not yet named; cost of building and grounds and furniture, $250,000. Bids for erection will probably be opened about March 1.

Jackson, Miss. — Association Building. — Plans by W. S. Hull have been adopted for proposed Y. M. C. A. building and call for a three-story building 47x105 feet, of pressed brick with stone trimmings. A gymnasium and swimming-pool will be included in the equipment; cost $30,000.

Jacksonville, Fla.—School Building.—J. A. McDonald has contract at $64,770 for the erection of high-school building for Duval county, previously mentioned.

Kissimmee, Fla.—Hotel.—Kissimmee Hotel & Improvement Co. is being organized with $50,000 capital stock to erect hotel.

Knoxville, Tenn.—Hotel.—C. B. Atkin, L. D. Tyson and Mrs. Jeannette Cowan have purchased the Lamar House, which will be destroyed and a hotel erected on the site.

Lawton, O. T.—School Building.—City is considering the issuance of $125,000 of bonds for school purposes. R. A. Jones is Mayor.

Lexington, Ky.—Lodge Building.—Bids will be received until January 9 by C. S. Graves, secretary building committee, at 345 Spring street, for a three-story building for Covenant Lodge, No. 22, I. O. O. F. Contractors may bid on the completion of the entire building or part of it. Plans and specifications on file at office of Martin Goertz, architect, Room 409, City National Bank Building. Usual rights reserved.

Lexington, Ky. — School Building. — Combs Lumber Co. has contract to erect building at the Kentucky State College after plans by H. L. Rowe; three stories; ordinary construction; steam heat; cost $26,000.

Little Rock, Ark.—Automobile Garage.—It is reported that the Little Rock Auto Co. will erect a $30,000 garage on site recently purchased at 311 West 3d street. Building will be of pressed brick, fireproof, 52x118 feet, and two stories high. A turntable and an electric elevator, machine shop, blacksmith shop, etc., will be installed. E. P. Ladd is president.

Little Rock, Ark.—Cotton Warehouse.—The erection of cotton warehouse is being considered. J. Lester Williams, Houston, Texas, State manager for the Farmers & Bankers' Warehouse Building Association, can be addressed.

Madisonville, Ky.—Hotel.—C. C. Givens will rebuild Lucille Hotel, lately burned. Reported new building will cost $35,000.

Manor, Texas—School Building.—City has voted affirmatively the issuance of bonds for the erection of school building. Address The Mayor.

Maysville, Ky. — School Buildings. — C. C. Weber & Co., Cincinnati, Ohio, have been commissioned to prepare plans for proposed school buildings.

McKinney, Texas.—Church.—First Baptist Church is completing arrangements for the erection of proposed $25,000 edifice. Address The Pastor.

Memphis, Tenn.—Flat Building.—Caruthers Ewing, R. Brinkley Snowden and Russell Martin will erect a $125,000 building, containing 30 flats, on site 105½x287 feet at Dunlap street and Poplar boulevard. Structure will be three stories, of stone construction, and the interior will be finished in hardwood. In the rear of the building a garage and stables will be built. (Lately mentioned.)

Millersville, Md.—Chapel.—Wyatt & Nolting, Keyser Building, Baltimore, Md., have completed plans for the Woodward Memorial Chapel; to be of stone, stucco and half timber, 30x43½ feet. Henry S. Rippel, 7 Clay street, Baltimore, Md., is estimating on the construction.

Mobile, Ala. — Veterinary Hospital. — Arrangements are being completed for the erection of proposed veterinary hospital, to be under the supervision of Joseph Pratt. The building will be two stories, of concrete blocks on a steel structure; floors to have a foundation of cement with creosoted blocks on top; stalls will have concrete floors and drained in the most sanitary manner; electric elevators; electric traveling cranes, and an apparatus heated by gas for giving the animals hot-water baths will be included in the equipment. A separate department will be equipped for canines.

Monroe, N. C.—Freight Depot and Platform.—Seaboard Air Line Railway is considering the erection of freight depot and transfer platform, but plans have not been prepared nor estimates made. Further announcements will probably appear in 30 days; chief engineer, W. L. Seddon, office at Portsmouth, Va. (Recently mentioned.)

Nashville, Tenn.—Lodge Building.—Thompson & Asmus are preparing plans for three-story annex to clubhouse.

Nashville, Tenn.—Church.—It is proposed to rebuild McKendree Church on old site, and the building committee has been authorized to perfect plans for the new church and receive estimates of its cost. Dr. W. B. Taylor is chairman of building committee.

Prescott, Ark.—Hotel.—C. L. Thompson, Little Rock, Ark., is preparing plans for hotel to be erected by the Prescott Hotel Co., mentioned December 6; two stories; 100x125 feet; brick; ordinary construction; steam heat; electric fixtures; cost $18,000. John A. Davis is chairman of building committee.

Newberry, S. C.—Courthouse.—Bids will be received until February 1 by George S. Mower, chairman building committee Newberry county courthouse, for the erection of courthouse building in accordance with plans and specifications on file with Frank P. Milburn & Co., architects, Home Life Building, Washington, D. C., also with County Clerk. Certified check for $1000 must accompany each bid; usual rights reserved.

Oklahoma City, O. T.—Office Building.—J. C. Fisher of Okene, O. T., is having plans prepared for a five-story building to cost $70,000.

Paducah, Ky.—Bank Building.—Plans are being prepared by Barnett, Haynes & Barnett, St. Louis, Mo., for building to be erected by the First National Bank; 10 stories; stone and brick; fireproof construction; steam heat; electric fixtures and electric elevator; cost $12,500. (Referred to December 27.)

Port Arthur, Texas.—Business Building.—F. Roth of Raton, N. M., is reported as to erect two-story brick building with a frontage of 75 feet.

San Marcos, Texas—School Building.—Arrangements are being made for the erection of an academy, under the auspices of the Baptist denominations, to cost about $100,000. Dr. J. M. Carroll can be addressed.

Savannah, Ga.—Bank Building.—The Citizens' & Southern Bank proposes erecting a one-story building for its own use. Architect has not yet been selected. It is reported the cost will be $150,000.

Senoia, Ga.—Bank Building.—W. L. Cole & Son have contract to erect building for the bank of Senoia, Lee Hand, president; to be 26x55 feet; white oil-pressed-brick front.

Sewell's Point, Va.—Exposition Building.—A. F. Withrow & Co. of Charleston, W. Va., have contract at $19,045 to erect the West Virginia Building on the Jamestown Exposition grounds after plans by Rabenstein & Warne of Charleston, W. Va.

Sewell's Point, Va.—Pier.—Bids for the construction of pier for the Tidewater Railway, to cost approximately $2,000,000, are reported as being asked; also bids for the removal of 700,000 cubic yards of sand will be called for shortly. It is also stated that a second pier will be constructed by the company later. H. Fernstrom, Norfolk, Va., is chief engineer. (The company was reported October 11 as arranging for the construction of coal pier 1370 feet long, with a maximum height of 82 feet at low water.)

Sharon, Ga.—Store Building.—C. H. Golucke, Crawfordville, Ga., has contract to erect brick building 56x70 feet for J. A. Kendrick, replacing structure recently burned.

Shreveport, La.—Car Barn.—W. H. Werner has contract to erect car barn for the Shreveport Traction Co., after plans by Perry, Bridges & Snyder; fireproof construction; cost $20,000. (Mentioned December 27.)

Spartanburg, S. C. — Apartment-house. — Spartan Improvement Co. has been incorporated with $40,000 capital stock by Howard Carlisle, D. O. Leonard, L. P. Epton and J. H. Carlisle, Jr., to erect a three-story apartment-house, 30x100 feet, of brick and equipped with electric and gas fixtures, elevators, etc.

St. Louis, Mo.—Flats Building.—Thomas Flanigan has purchased site on which to erect flats building.

Washington, D. C.—Dwelling.—Permit has been granted to Edward M. Dulin, 2220 Pennsylvania avenue N. W., for the construction of dwelling at 1270 New Hampshire avenue N. W.; three stories, 28x38 feet; brick with Indiana limestone trimmings; galvanized-iron cornice; slate roof; electric wiring and fixtures; sanitary plumbing; hot-water heating system; cost about $15,000; W. S. Plager, architect, 3 B street N. W.

Washington, D. C.—Dwelling.—George T. Poter has awarded contract to H. V. Sanford, 1321 G street N. W., for alterations to dwelling at 1325 New Hampshire avenue N. W. Plans provide for brick and stone work, structural iron and steel; tiling, electric wiring and fixtures, sanitary plumbing and hot-air heating system; Frederick B. Pyle, architect, 1003 F street N. W.

Washington, D. C. — Warehouse. — A. M. Schneider, architect, Bond Building, 14th street and New York avenue N. W., is preparing plans and specifications for warehouse; two stories; 42x130 feet; brick; trussed-steel roof; tin roof; electric wiring and fixtures.

Spiro, I. T.—School Building.—T. T. Reddick of Fort Smith, Ark., has contract to erect proposed $10,000 brick school building.

Statesboro, Ga.—Business Building.—Ludden Bates' Southern Music House is completing arrangements for the erection of building.

St. Petersburg, Fla.—Laundry Building.—Bids will be received by J. S. Norton until December 29 for the erection of laundry building in accordance with plans and specifications on file.

Tampa, Fla.—Dwelling.—George S. Petteway, it is reported, will erect residence on Bayshore boulevard.

Tampa, Fla.—Dwelling.—Jetton-Dekle Lumber Co. has contract to erect residence for B. W. Blount on Bayshore boulevard; brick, stone and marble, and cost $47,500. Miller & Kennard prepared the plans.

Water Valley, Miss. — School Building. — City is reported to issue bonds for the erection of school building, replacing structure recently burned. Address The Mayor.

Waycross, Ga.—Dwelling.—W. H. Buchanan will erect residence.

Williamson, W. Va.—Lodge and Office Building.—It is proposed to erect a three-story pressed-brick combined office and lodge building for the I. O. O. F., replacing structure recently burned at a loss of $7,800.

Winchester, Va.—Library.—John Handley Library building, recently noted, will be of fireproof construction, 80x80 feet; low-pressure steam heat; combination gas and electric-lighting fixtures; no elevators; wiring for electrical lighting; to be completed July 1, 1907. As has been stated, contract for erection was awarded to Mankin Construction Co. of Richmond, Va., and the architects are Barney & Chapman, 520 Fifth avenue, New York; contract price $110,743.98.

Yazoo City, Miss.—City Hall.—Morford & Co. have contract at about $25,000 for the erection of City Hall; previously mentioned. R. H. Hunt, Chattanooga, Tenn., prepared the plans.

RAILROAD CONSTRUCTION.

Railways.

Americus, Ga.—Crawford Wheatley, one of the incorporators of the Western & Gulf Railway, which is to be built from Americus to Hawkinsville, Ga., including other points, such as Vienna, is reported as saying that subscriptions have been freely offered along the line which has been partially surveyed by G. D. Allen. It is expected to complete the line within a year.

Anniston, Ala.—Horace McCaull is reported to be working on a plan to build the proposed Alabama Gulf Railroad from Anniston via Opelika and Lafayette to Eufaula, Ala.

Atlanta, Ga.—The Lane Bros. Company of Lynchburg, Va., has been given a contract to build 10 miles of line for the Atlanta, Birmingham & Atlantic Railroad into Atlanta.

Bartlesville, I. T.—The St. Louis, Oklahoma & Pacific Railway, which proposes to build a line from Joplin, Mo., via Bartlesville, to Pond Creek, Okla., has filed its charter; capital $7,200,000. The incorporators and directors are F. M. Overlees of Bartlesville, president; H. J. Holm also of Bartlesville, secretary; Conrad Strecker of Pond Creek, treasurer; George B. Keeler and J. J. Curl of Bartlesville, W. M. Barnum and Michael Cunyan of Pona City, Okla., and J. W. Bird of Pond Creek. Senator S. M. Porter of Caney, Kan., is also said to be interested.

Baton Rouge, La. — Reported that plans have been drawn for Chicago capitalists to build a railroad from Baton Rouge to connect with the Illinois Central Railroad at or near Amite City, 45 miles. A. S. Baldwin, chief engineer of the Illinois Central at Chicago, may be able to give information.

Baton Rouge, La.—The Colorado Southern, New Orleans & Pacific Railway has let a contract to the Kenefick, Hammond & Quigley Construction Co. of Beaumont, Texas, to build its yards at Port Allen, opposite Baton Rouge, and also the yards at Dequincey, La.

Beaumont, Texas.—The Galveston, Beaumont & Northeastern Railway, which is being built by the Miller & Vidor Lumber Co. from Vidor, Texas, on the Kansas City Southern Railway, six miles northeast of Beaumont, is reported completed for over 20 miles. The charter permits the construction of 100 miles of line.

Bogalusa, La. — The New Orleans Great Northern Railroad has announced plans to build yards at Bogalusa. J. F. Coleman is chief engineer at 920 Hibernia Bank Building, New Orleans.

Brownsville, Texas.—Col. Uriah Lott is reported as saying that permanent location is now being made for the branch line of the Brownsville, Hidalgo & Northern Railroad from Laureles to Laredo, Texas. Permanent survey is completed from Brownsville to Corpus Christi on the main line and also for the branch to Hidalgo. He expects to begin active construction as soon as the survey is finished.

Brownwood, Texas.—Reported that G. H. Connell of Fort Worth, W. S. Hipp of Houston and H. C. Kerhns of Chicago have been investigating a route for a railroad from San Antonio via Fredericksburg, Llano and San Saba to Cisco and Brownwood.

Charleston, W. Va. — Mr. Clifford Buxton, chief engineer, Toledo, Ohio, informs the Manufacturers' Record that while the Kanawha & Michigan Railway is making some slight change in its alignment, there is no project to reduce grades and curves on the entire line. This denies a recent press report. He also says that one quite notable change is being made which eliminates about 280 degrees of curvature and reduces distance about 1800 feet. This involves a tunnel of 850 feet. Talbot & Lindsay of Middleport, Ohio, are the contractors, under the supervision of Mr. Buxton. The company contemplates another change which would demand the rebuilding of a bridge over the Ohio.

Clarendon, Texas.—An officer of the Oklahoma, Texas & Gulf Railroad Co., recently incorporated, is reported as saying that bids will be asked next month to build its proposed line from Clarendon via Belair, Roosevelt, Apache and Marlow, Okla., and Ardmore and Lehigh, I. T., to Nashville and Hope, Ark., about 400 miles. L. B. Comer of Fort Worth, Texas, and others are the incorporators.

Cleveland, Texas.—The Kirby Lumber Co. is reported to be surveying for a railroad from Cleveland along Tarkington bayou to timber lands. John H. Kirby of Houston, Texas, is president.

Clintwood, Va.—W. H. Rouse, attorney, is reported as saying that the South & Western Railway has located nearly all its line in Dickinson county, Virginia, and active construction will begin soon. W. A. Doane is principal assistant engineer at Bristol, Tenn.

Covington, Ky.—Reported that a belt railroad will be built connecting Cincinnati, Ohio, Covington and Newport, Ky., and other points.

Darien, Ga.—Mr. H. D. Emerson, vice-president and general manager of the Georgia Coast and Piedmont Railroad, is reported as saying that work will begin immediately on the proposed extension from Darien to Brunswick, Ga., 18 miles.

Duncan, I. T.—Col. William Pettigrew is reported to be promoting a plan to build an electric railroad from Duncan to Marlow.

Elkhorn City, Ky.—The Chesapeake & Ohio Railway will, it is reported, build a new railroad into Letcher county, Kentucky, to reach properties of the Northern Coke & Coal Co. It will be about 40 miles long and will go along Boone's fork. H. Pierce is engineer of construction at Richmond, Va.

Fayetteville, N. C.—The Bladen Northern Railroad Co., which is to build a line about 30 miles long from Stedman to Elizabethtown, has elected officers as follows: John G. Shaw of Fayetteville, president; E. E. McCulloch of White Oak, vice-president; board of directors, Messrs. E. G. Moffit, T. L. Chisholm and D. E. McIver of Sanford; A. A. Chapman of Oxford; R. T. Gray and H. Litchford of Raleigh.

Felsenthal, Ark.—Reported that the firm of Milkey Bros. (Theodore B. Milky and Omar Milkey) will build a railroad out of Felsenthal to handle lumber for their mill.

Gadsden, Ala.—The Brown Construction Co. of Attalla, Ala., has, it is reported, been given a contract by the Alabama Great Southern Railway to build one mile of line in West Gadsden.

Gaffney, S. C.—A press report notes a rumor that the Seaboard Air Line has acquired the route of the old Three C's road from Marion, N. C., to Camden, S. C., including 11 miles of line between Blacksburg and Gaffney, and that construction is proposed. W. L. Seddon is chief engineer at Portsmouth, Va.

Glen Mary, Tenn.—The Glen Mary Railroad Co., it is reported, announces that capital has been secured and construction will soon begin for the proposed line from Glen Mary to Oliver Springs. G. W. Chandler of Harriman, Tenn., is one of the incorporators.

Haleyville, Ala.—It is rumored that the Illinois Central Railroad may continue its extension from Haleyville to Jasper, Ala., 40 miles, instead of using the Southern Railway track for part of its route to Birmingham. A. S. Baldwin is chief engineer at Chicago, Ill.

Hattiesburg, Miss.—D. C. Dunlap of Chicago, engineer, and Will A. Aaron of Hattiesburg, secretary of the company, are reported to have completed the reconnoissance survey for the Birmingham & Mississippi Southern Railroad from Hattiesburg and Birmingham, Ala., and have now begun a similar trip over the branch line from Waynesboro to Scranton, Miss.

Kitchen, N. C.—The Manufacturers' Record is informed that the Kitchen Lumber Co. will build tramroads in and around Kitchen. Charles Kitchen of Leon, Ky., is president; R. H. Vansant, vice-president; John W. Kitchen, treasurer, and James H. Kitchen, secretary.

Lake Charles, La.—The St. Louis, Watkins & Gulf Railway has begun legal proceedings to secure rights of way for its proposed extension. H. B. Stone is general manager at Lake Charles.

Memphis, Tenn.—The Yazoo & Mississippi Valley Railroad, Illinois Central system, will, it is reported, soon let a contract to build second track between Memphis and Lake Comorant. A. S. Baldwin is chief engineer at Chicago, Ill.

Mineral Wells, Texas.—The Mineral Wells & Northwestern Railway is reported to have let a grading contract for 15 miles of line to D. J. Grigsby.

Monticello, Ky.—Mr. J. M. Ross of Somerset, Ky., informs the Manufacturers' Record that citizens of Monticello have subscribed $40,000 toward building the first 22 miles of the proposed Burnside & Cumberland River Railroad to run from a connection with the Tennessee Central via Monticello and Somerset to Corbin, Ky. It is said that other financial arrangements have been made and construction will begin in 60 days. James Denton is attorney at Centerville.

Natchitoches, La.—Reported that D. C. Scarborough has issued a letter to the Progressive League calling a meeting to consider a proposition from a railroad to build its line into Natchitoches.

New Orleans, La.—A. V. Kellogg, engineer maintenance of way, announces that bids for grading to extend the Bayou Sale branch of Morgan's Louisiana & Texas Railroad four miles, and also the Eunice branch six miles, will be received until noon on December 31 at 511 Natchez street, New Orleans.

New Orleans, La.—D. D. Curran, general manager of the Queen & Crescent, is reported as saying that the building of second track on the New Orleans & Northeastern Railroad will begin early this year between New Orleans and Lake Pontchartrain. About 13 miles of track will be laid.

Norman, Okla. — The City Council has granted a franchise to the Tecumseh & Norman Traction Co., which proposes to build a line connecting the two points named via Big Jim Crossing.

Oklahoma City, Okla.—The St. Louis, Oklahoma City & Henryetta Railway Co. has completed its survey from Henryetta to Oklahoma City. George W. Drumheller of New York is engineer. The officers are: President, J. H. Dibble; vice-president and treasurer, J. H. Wheeler; secretary, J. W. Pryor; general counsel, J. W. Shartel. The Statehood Construction Co., which is to build the line, including two extensions, or altogether 280 miles, has officers as follows: President, R. T. Edwards; secretary, R. H. Gardner; treasurer, J. H. Wheeler. The line is to develop coal properties near Henryetta, but will, it is said, build an east and west trunk line.

Pine Bluff, Ark.—J. M. Parker, general manager of the Southern Development Co., which is to build the line, is reported as saying that the construction contract for the proposed new railroad from Pine Bluff to Monroe, La., will be let in a few days.

Port Arthur, Texas.—The Port Arthur & Houston Short Line has applied to the Railroad Commission for authority to issue bonds on its proposed railroad from Port Arthur via Wallisville and Laport to Dumont, 86 miles, the latter point being 10 miles south of Houston on the Galveston, Houston & Henderson Railroad. A. O. Blackwell is secretary of the company at Laporte, Texas. A later report says the application has been granted. H. F. Best of Port Arthur is reported as saying that construction will begin with the new year.

Rockland, Texas.—W. H. Aldridge, president of the Aldridge Lumber Co., which is interested in the road, is reported as saying that contract has been let to build a 10-mile extension of the Burr's Ferry, Browndell & Chester Railroad from Aldridge to Browndell.

Roscoe, Texas.—Construction is reported begun at Snyder, Texas, on the proposed Roscoe, Snyder & Pacific Railway.

Seligman, Ark.—The Missouri & North Arkansas Railroad has let a contract to John Scott & Sons of St. Louis to grade the proposed extension from Seligman to Neosho, Mo., work to be completed in six months.

St. Mary's, Ga.—Capt. L. Johnson of St. Mary's is reported as saying that contract has been let to S. D. Hawks of Colesburg, Ga., to complete grading on the St. Mary's & Kingsland Railroad, which is to be ready for operation by June 1. Line is 10 miles long and only five miles of grading remain to be done. Otherwise called the St. Mary's, Waycross & Nashville Railroad.

Stephenville, Tex.—Cage & Crow propose to build a railroad from Stephenville to Hamilton, Texas. Among others interested are McD. Reil, G. W. Jenks, J. C. George, Lee Riddle, Eli Oxford and Hunt Perry.

Wayne, W. Va.—Reported that the Norfolk & Western Railway has closed a deal for the Big Sandy, East Lynn & Guyan Railroad, now built from Wayne Court House to East Lynn, eight miles, and it will be extended. C. S. Churchill is chief engineer at Roanoke, Va.

Webster Springs, W. Va.—The West Virginia Midland Railroad is reported to be making a new survey from Brewster along Laurel Run and the Little Kanawha river to Buckhannon. George A. Hechmer is general manager at Webster Springs.

Street Railways.

Ardmore, I. T.—H. E. Foster, manager of the Ardmore Electric Light & Power Co., is quoted as saying that the directors have authorized him to proceed to build the street railway. Among the principal stockholders and directors are Sam Trubshaw and J. B. Klen of St. Louis; Henry Braum of Guthrie, Okla.; George E. Wells of St. Louis; H. E. Foster and L. P. Anderson of Ardmore, I. T.

Gadsden, Ala.—The Alabama City, Gadsden & Attalla Street Railway Co. has filed a mortgage for $300,000 to provide for improvements.

Hagerstown, Md.—The Hagerstown Street Railway Co. proposes to increase its capital from $200,000 to $1,000,000, the increase to be used for extensions.

MACHINERY, PROPOSALS AND SUPPLIES WANTED.

Manufacturers and others in need of machinery of any kind are requested to consult our advertising columns, and if they cannot find just what they wish, if they will send us particulars as to the kind of machinery needed we will make their wants known free of cost, and in this way secure the attention of machinery manufacturers throughout the country. The Manufacturers' Record has received during the week the following particulars as to machinery that is wanted.

Air Compressor.—C. I. B. V., care of Manufacturers' Record, Baltimore, Md., wants an air compressor of from 300 to 1000 cubic feet per minute capacity, steam driven, for temporary use, and would like to rent the same for a period of four months.

Automatic Folding Boxes.—See "Box Machinery."

Baking Ovens.—Ice-Cream Cone Corporation, J. M. Fentress, president, Norfolk, Va., needs ovens for baking cakes.

Blowing Fan. — J. M. Brosius, Bessemer, Ala., wants prices on fans (Sturtevant preferred).

Boiler.—Lewis Lumber & Manufacturing Co., Hattiesburg, Miss., wants a 48-inch by 14-foot boiler. (See "Engines and Boiler.")

Box-factory Equipment.—Wanted complete outfit of machinery for equipping a factory for the manufacture of cigar boxes of a capacity of not less than 3000 boxes per day. Submit prices on the entire outfit complete. Address American Manufacturing Co., Inc., Atlanta, Ga.

Box Machinery.—A. S. Kratz Company, 13 Governor street, Richmond, Va., wants automatic folding-box machinery.

Brick Machinery. — Robert Smith, Tyler, Ala., is in the market for complete brick-making machinery.

Brick Machinery. — Wanted — One second-hand No. 2 and No. 3 Steele's brick machine with automatic side cutting and trucks for small brick plant. Address American Manufacturing Co., Atlanta, Ga.

Building Materials. — Bonniwell & Son, architects, Room 12 Jackson Building, Tampa, Fla., want catalogues of all classes of building materials.

Button Machinery.—J. F. Bailey, No. 818 South Fifth avenue, Nashville, Tenn., wants machinery for making buttons out of shells.

Cement.—Southern Bituilthic Co., Nashville, Tenn., wants prices on natural and Portland cement.

Crane. — J. M. Brosius, Bessemer, Ala., wants prices on traveling crane.

Cutting Machines.—Yeager-McLean Manufacturing Co., Gastonia, N. C., wants a machine for cutting bias bands for the manufacture of silk petticoats.

Dredging.—Atchafalaya Bay Ship Channel Co., E. A. Pharr, manager, Morgan City, La., is inviting bids on dredging a channel 15 feet deep, 100 feet wide and 1 miles long. Plans and specifications now ready.

Electrical Equipment. — Lewis Lumber & Manufacturing Co., Hattiesburg, Miss., wants 50 to 100-light dynamo.

Elevator.—Bids will be received until January 15 at the office of Elliott Woods, superintendent United States Capitol Building and Grounds, Washington, D. C., for passenger elevator for office building, House of Representatives. Plans and specifications can be had on deposit of $25. Certified check for 2 per cent. of amount of bid must accompany each bid. Usual rights reserved.

Elevator.—Norris & Lockett Company, Inc., Henderson, Ky., wants prices on electric elevators.

Engine.—Blackwell Seed Grader & Incubator Co., Blackwell, O. T., wants a 10 to 20-horse-power gas engine.

Engine.—Wanted—One 12 to 15-horse-power portable engine, second hand; name best cash prices. Address American Manufacturing Co., Inc., Atlanta, Ga.

Engine.—Clarence Urban, Wylie, Texas, will purchase gasoline engine.

Engines and Boiler.—Lewis Lumber & Manufacturing Co., Hattiesburg, Miss., wants a 15-horse-power engine, 75-horse-power engine and 48-inch by 14-foot boiler.

Filter Equipment. — Robinson Hotel Co., Tulsa, I. T., wants filter equipment to filter water for entire hotel of 105 rooms, including 20 bathrooms, kitchen, etc. Use city water through a 3-inch main.

Furniture Factory Equipment.—A. W. Robbins, Rocky Mount, Va. (not Rocky Mount, N. C., as erroneously reported last week), will purchase machinery for the manufacture of furniture.

Garbage Crematory.—Bids will be received until January 26 at the Bureau of Yards and Docks, Navy Department, Washington, D. C., for constructing a garbage crematory at the navy-yard, Pensacola, Fla. Plans and specifications can be seen at the bureau or will be furnished by the commandant of the navy-yard, Pensacola, Fla.; Mordecai T. Endicott, chief of bureau.

Ice Machinery.—J. K. Wilson, 200 North Edith street, Albuquerque, N. M., wants information regarding the manufacture of ice and the best system to use.

Ice Machinery.—Thomas Popp, Charleston, W. Va., wants address of manufacturers of ice machines.

Lumber.—Houston Show Case Co., Houston, Texas, wants quotations on pine and hardwood lumber.

Lumber.—Jordan Bros. Lumber Co., Norfolk, Va., wants lumber of all kinds in carload lots.

Machine Tools.—Lewis Lumber & Manufacturing Co., Hattiesburg, Miss., wants automatic knife grinder.

Marble Work.—Elliott Woods, Superintendent U. S. Capitol Building and Grounds, Department of Interior, Washington, D. C., will receive bids until January 30 for furnishing and erecting in place marble work for conference-room of U. S. Senate office building. Plans and specifications may be obtained from above office.

Miscellaneous Supplies. — Bids will be received until January 14 at office of D. W. Ross, general purchasing officer, Isthmian Canal Commission, Washington, D. C., for furnishing by steamer, free of all charges, on dock at either Colon (Atlantic port) or La Boca (Pacific port), Isthmus of Panama, rivets, nuts, washers, screws, tire bolts, steel shafting, I-beams, sand dryers, plows, portable scales, chisels, leather punches, axes, tool handles, machinists' taps, stock and dies, grindstones, oilers, hinges, demijohns, batteries, lamps, gauge glasses, cotton drilling, salsoda, etc. Blanks and information relating to circular No. 346 may be obtained at office of general purchasing officer or offices of assistant purchasing agents, 24 State street, New York; Custom-house, New

Orleans; 1086 North Point street, San Francisco, and 410 Chamber of Commerce Building, Tacoma; also from Chief Quartermaster, Chicago; Depot Quartermaster, St. Louis; depot Quartermaster, Jeffersonville, Ind.; Chief Quartermaster, Atlanta, Ga., and Commercial Club, Mobile, Ala.

Naval Supplies.—Bids will be received until January 8 at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., as specified, for a quantity of naval supplies as follows: Kitchen equipment, dump grates, grate blocks and bars, etc. Applications for proposals should refer to Schedule 320. Blank proposals will be furnished on application to navy pay office, Baltimore, Md., or to the bureau; E. B. Rogers, Paymaster-General, U. S. N.

Naval Supplies.—Bids will be received until January 8 at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., for furnishing at the navy yard, Norfolk, Va., a quantity of naval supplies, as follows: Schedule 322, linoleum, ash; schedule 323, tool steel, steel billets. Applications for proposals should designate the schedules desired by number. Blank proposals will be furnished on application to the navy pay office, Norfolk, Va., or to the bureau; E. B. Rogers, paymaster-general, United States Navy.

Paving.—R. S. Williams, City Treasurer, Montgomery, Ala., will receive bids until January 21 for paving sidewalks on Bell street and Pleasant avenue with hexagon block or Schillinger pavement in accordance with specifications on file in City Engineer's office. Bid on Bell street to be accompanied by certified check for $200; bid on Pleasant avenue to be accompanied with certified check for $100; usual rights reserved.

Piping. — Alabama Pyrites Co., Pyriton, Ala., wants 2000 feet of six-inch steam pipe with flange joints; second-hand.

Piping.—See "Sewerage System."

Planing Mill. — American Manufacturing Co., Atlanta, Ga., wants one second-hand planing mill outfit for small plant. This is wanted for plant to make building material. Name list with best cash prices, etc.

Plumbing.—Bids will be received until January 16 at the office of Ennis M. Douglas, City Register, Memphis, Tenn., for the installation of a new plumbing outfit in the City Hospital on Madison street. Certified check for $250 must accompany each bid. Specifications can be seen at office of Chighizola, Hanker & Cairns, 636-640 Scimitar Building; usual rights reserved. James H. Malone is Mayor.

Porch Columns. — King Mantel Co., Knoxville, Tenn., wants addresses of manufacturers of porch columns.

Printing Plant. — Gainesville Publishing Co., P. O. Box 271, Gainesville, Ga., will want prices on complete equipment for newspaper plant, including press, type, etc.

Printing Plant.—Clarence Urban, Wylie, Texas, will purchase printing presses, type and other printing material.

Pumps.—American Manufacturing Co., Atlanta, Ga., wants one second-hand belted plunger pump for lifting water out of a 40-foot well into a 15-foot tank to supply three 100-horse-power boilers.

Railway Equipment.—Kitchen Lumber Co., Charles Kitchen, president, Leon, Ky., will be in market for logging cars, logging equipment, etc., for tramways.

Railway Equipment.—J. F. Donahoo, Munsey Building, Washington, D. C., is in the market to lease direct from owners for a period of at least one year (with privilege of buying) about three miles of 56-90-pound good steel relaying rails, with angle bars.

Sawing Machines.—See "Talc Sawing Machines."

Sawmills. — Kitchen Lumber Co., Charles Kitchen, president, Leon, Ky., will be in market for two complete sawmills, including eight-foot band mill and small six-foot portable band mill; also for tramway construction materials and cars. (Proposes manufacturing 100,000 feet daily.)

Sewer Construction.—Sealed proposals for construction of 17,600 feet of clay-pipe sewers for city of Van Buren, Ark., will be received at the office of L. H. Southmayd, Van Buren, until 12 o'clock noon Tuesday, January 22, 1907. Plans, specifications and approximate amount of materials, quantities and sizes of pipes and forms of proposals or further information may be had of **Theodore Hartman**, engineer in charge, 1122 Center street, Little Rock, Ark.; also after January 1, 1907, of L. H. Southmayd, Van Buren, Ark. Certified check of $500 must accompany proposals. Usual rights reserved. Address all proposals to L. H. Southmayd, Charles A. Pape and John O'Kane, Commissioners of Sewer District, No. 1, and mark envelopes "Proposals for Sewers."

Sewerage System.—W. E. Smith, City Engineer, Webb City, Mo., will receive bids until January 7 for furnishing material and constructing sewer in District 16; materials to consist of 1999 feet eight-inch sewer pipe, 170 Y junctions, six manholes, one flush tank, 1705 cubic yards excavations (trench 2.5 feet wide), 150 cubic yards embankment; engineer's estimate on work, $4,424.81. Certified check for $100 must accompny each bid; usual rights reserved.

School Furniture.—Burdine Webb, chairman Board of Trustees, Sergent, Ky., wants catalogues and price lists of school desks, furniture and supplies for furnishing public school building.

Sheet-metal Works.—Davis Bros., Hiddenite, N. C., want addresses of sheet-metal workers; want to have family coffee roasters (constructed of sheet-iron) made in quantities.

Steam Shovels.—Edw. McDowell, 1020 Fourth National Bank Building, Atlanta, Ga., is in the market for two Little Giant steam shovels, standard 1¼-yard.

Talc Sawing Machines.—American Talc Co., 88 Broad street, Boston, Mass., wants addresses of manufacturers of machinery for sawing talc in small pieces suitable for working on metal, etc.; also for turning talc in short round pieces to be used for the same purpose.

Water Supply.—City of Buena Vista, Ga., S. N. Rushin, Mayor, wants proposals for best method of developing water supply. Well is 245 feet deep; water 100 feet in well.

Wiring Machine. — Frank Wright, Cave Springs, Ga., wants a second-hand blind slat wirer.

Woodworking Machine. — Frank Wright, Cave Springs, Ga., wants a small dowell machine; second-hand.

Woodworking Machinery.—Blackwell Seed Grader & Incubator Co., Blackwell, O. T., wants 16-inch planer, joiner, band saw, boring machine, cut-off saw, rip-saw, sander and turning lathe; new or second-hand.

Woodworking Machinery.—Lewis Lumber & Manufacturing Co., Hattiesburg, Miss., wants self-feed rip saw, shingle machine, etc.

Woodworking Machinery. — See "Box-factory Equipment."

Woodworking Machinery. — Wanted — One second-hand machine to make picker sticks for cotton mills. Address American Manufacturing Co., Atlanta, Ga.

Woodworking Machinery. — Wanted — One second-hand saw table that has a raising mandrel and iron table; one second-hand variety woodworker with attachments. Address American Manufacturing Co., Atlanta, Ga.

Woodworking Machinery. — Wanted — One second-hand lathe machine and bolter, one drag saw and one short-log saw for making ready material for lathe machine. Address American Manufacturing Co., Atlanta, Ga.

Woodworking Machinery. — Wanted — One second-hand saw table with carriage that will rip six foot in length and will have about an 18-inch saw to square logs of from 10 to 12 inches diameter. Name best cash prices. Address American Manufacturing Co., Atlanta, Ga.

"Albany Grease a Standby."

Messrs. Adam Cook's Sons of New York, the makers of Albany grease, have received a letter from H. Schroeder, chief engineer of the Consumers' Company, Chicago, regarding his experience with the lubricant. Mr. Schroeder writes: "I received your No. 3 Marine Cup and I think it is a grease-saver compared with the one we make. We have eight threads to the inch on our cup, so you see we are practically wasting the grease with our cup; and in regards to your Albany grease, there is nothing on the market that will beat it, for I had experience in using Albany grease for the last 13 years; six years as oiler, five years as assistant engineer and two years as chief engineer. Now and during my time as oiler and assistant engineer, my predecessors had tried all kinds of grease, but after a few days' trial turned back to the old standby—Albany grease. I tried a well-known grease about six months ago, and got the same results. I even took a sample of your Albany grease and a sample of three other makes of grease to our chemist to make a chemical test, also acid test, and I was surprised to see what acid the other greases contained compared with Albany grease, and it would do your heart good to see the difference in color in these four samples from different firms. Albany grease showed, when it was in a liquid form, good enough to drink; the others showed, well I cannot express it in writing to you, but I know what I am talking about, for I use about 500 pounds of your Albany grease a month."

INDUSTRIAL NEWS OF INTEREST

Offers Timber Rights.

The timber rights on 3000 acres of land in South Carolina are offered for sale by the Concrete Machinery & Supply Co. of Columbia, S. C.

Baldwin Locomotive Offered.

An 18-ton Baldwin locomotive, 36-inch guage, recently repaired and in good condition, is offered for sale by the Cairo & Kanawha Railway Co., Parkersburg, W. Va. Engine can be seen at Cairo, W. Va.

A Georgia Plantation.

A 12,000-acre plantation in Georgia is offered for sale. It includes 2500 acres of yellow-pine timber, agricultural equipment, cotton ginning, etc., and is suitable for colonization. Address the Georgia Loan & Trust Co. for details.

Water-Works Property Sale.

The property rights and franchises of the Tuscaloosa Water-Works Co. will be offered publicly for sale at Tuscaloosa, Ala., on February 28. Not less than $60,000 will be accepted. For information address A. E. Boardman, the receiver.

Mr. J. E. Franks, Atlanta.

Mr. J. E. Franks of Savannah, Ga., announces the removal of his offices to 329 Candler Building, Atlanta, Ga. He believes Atlanta a more central point for his activities in selling rails, frogs, switches, cars, locomotives and special work.

Hotel for Sale.

There is offered for sale a complete 40-room hotel, centrally located, in Oklahoma City. Full particulars regarding this opportunity and other business opportunities can be obtained by addressing V. E. Hoskins & Co., care Hotel Kross, Oklahoma City, O. T.

West Virginia Coal Land.

Among the present offerings for sale of West Virginia coal land is a 2000-acre tract in Tygerts Valley. It is said this property has great possibilities for development, especially as a coking proposition. For information address No. 59, care of the Manufacturers' Record.

More Hotels for San Francisco.

The estate of Irving M. Scott has commissioned Frank B. Gilbreth of New York to erect the New Pacific Grand Hotel at Ellis street and Anna lane. Mr. Gilbreth will also construct another hotel, the Union Square, from plans which have been prepared by Frank T. Shea, architect.

Industrial Plants Offered.

Several industrial plants located in a mining town on the Frisco Railroad are offered for sale and must be disposed of promptly. They include ice plant, laundry, mill, gin and bottling works. Plants can be purchased either separately or as a whole. For information address Box 124, Carbon Hill, Ala.

Pittsburg Real Estate Offerings.

Among Pittsburg real estate offerings for rent is a substantial stone and brick building with 11,000 feet of floor space, well located; another offering is a site on Liberty avenue, claimed to be sure of an advance in the near future; this is for sale. For information address J. D. Simons, 202 Ferguson Building, Pittsburg, Pa.

Rice-Milling Property Sale.

Manufacturers or investors who are prepared to consider a rice-milling proposition are advised that the Georgetown Rice Milling Co. will offer its plant for sale at Georgetown, S. C., on January 15. This plant is on the Sampit river, has 575 feet of water front, and is otherwise admirably located. For particulars address the company.

Shimer & Sons' New Shop.

Messrs. Ballinger & Perrot, architects and engineers, 1200 Chestnut street, Philadelphia, are just completing a machine shop for Samuel J. Shimer & Sons, Milton, Pa. The structure is 141x74 feet, two stories high. The column, floor and roof construction are of reinforced concrete and the walls are of monolithic concrete, with horizontal rustications. The roof covering is slag.

Received Railroad Construction Contract.

The Turner Construction Co. of New Orleans has, according to a report from Springfield, Ill., been given a contract to build an electric railroad for the Springfield & Southeastern Traction Co. from Springfield to Pana, Ill., 50 miles. Dr. Dixon of New Orleans is mentioned as the promoter of the enterprise and J. J. King president of the railroad company.

A Southern Investment Offered.

That oil exists in profitable quantities in Louisiana has been shown by past developments. In the Colfax section a new company is now drilling, and will also develop extensive tracts of timber land. This company is offering its stock for sale and will send full particulars to inquirers. It is the Gallway Oil Corporation, Colfax, La. Leading business men of the State are interested in the enterprise.

An Inducement for Manufacturers.

Manufacturers prepared to consider sites for the establishment of plants are advised that inducements are being offered in a certain section of the country. In this section $500,000 as a bonus and a free site is available for factory owners who may be prepared to consider propositions. It is stated that cheap gas and coal is at hand and the best of shipping facilities, both by rail and water. For information address "Site," care of the Manufacturers' Record.

More Contracts for Burns & Co.

Messrs. Robert M. Burns & Co., Railway Exchange, Chicago, report the sale of 20 80,000-pound gondola cars and five tank cars to the American Car & Equipment Co.; to the Alfalfa Meal Co., five tank cars; to Chicago Mill & Lumber Co., one eight-wheel American type locomotive for new race road in Arkansas; to Engle Land & Lumber Co., 100 tons of rails, five flat cars and one box car. Messrs. Burns & Co. are ready to submit estimates on all kinds of railway equipment.

To Handle Cleveland Business.

In order to handle to the best advantage its large and rapidly increasing business in the Cleveland section, the Pittsburg Automatic Vise & Tool Co. of Pittsburg, Pa., established a branch office on January 1 in the Schoefield Building, Cleveland, Ohio. The company proposes carrying a well-assorted stock of all kinds of vises constantly on hand, so that there will be as little delay as possible in filling orders from that district. This company is well known as being the manufacturers of the celebrated "Pittsburg" double and single swivel vises.

Capital Wanted in Arkansas.

Active endeavors are being made to interest capital in the development of Arkansas' mineral resources. It is claimed the State has 6,400,000 acres of coal, 3,000,000 acres of iron, more than 1,000,000 acres of lead and zinc, marble beds, granite, asphaltum and bauxite deposits. Those who may be prepared to invest in developments in Arkansas are invited to write for detailed information of the opportunities. Address Guy B. Tucker, Commissioner of Mines, Manufactures and Agriculture, Little Rock, Ark.

Enterprise Adding to Facilities.

The meeting of the stockholders of the Lynchburg (Va.) Foundry Co. on December 18 to increase capital stock prompts brief reference to that enterprise's progress during recent years. The company has capital stock of $350,000 and the increase will be to $500,000—common $300,000 and preferred $200,000. The company owns the McWane Pipe Works, the Radford Pipe Works and the Lynchburg Plow Co. Five years ago it employed 60 men and had a capital of $80,000. Today it employs 500 men and its annual business totals $1,250,000. Its pipe output daily has increased from 12 to 150 tons in four years. New York office at 220 Broadway.

The Pittsburg Reduction Co.

Under date of December 28 the Pittsburg Reduction Co. announces that by action of stockholders and directors, and on approval by the proper officers of the Commonwealth of Pennsylvania, the name of the Pittsburg Reduction Co. has been changed to the Aluminum Company of America, taking effect January 1, 1907. It was desired to conduct the business of the company under a name which discloses the nature of the business. The change is solely one of name, as the stockholders, directors, policy, management, officials, etc., remain as heretofore.

Large Pumps for Sale.

The old water-power plant of Columbia, S. C., is offered for sale, bids for all or any portion to be opened January 15. It comprises two 1,500,000-gallon pumps and fittings, two parts of flumes, eight iron beams, several tons of old pipe and junk, several hundred feet of cast-iron pipe and about 1000

pounds of old brass fittings. Bids must be accompanied by a certified check for one-third amount of proposal, to be forfeited if purchaser does not remove property within 30 days after notice of sale. Committee in charge consists of Messrs. Ernest M. DuPre, chairman; John A. Willis and W. T. Hamrick, Columbia, S. C.

Glucose and Corn Products Plant.

A large plant for manufacturing glucose and other corn products will be offered for sale on January 17. It has a capacity of about 10,000 bushels per day, and includes modern elevator, storage tanks, millhouse, refinery, kilns, machine shop, boiler and engine rooms, blacksmith shop, residences, 2500 feet of standard-gauge railway track, 55-room hotel, etc. This enterprise is located on the Texas & Pacific Railroad, about six miles from Donaldsonville, La., and the auction will be conducted by S. H. St. Martin in Donaldsonville. A detailed description of the property and other information can be obtained by addressing James P. Kock, Belle Alliance, La.

More Orders Received.

Recent orders secured by the Atmospheric Condensation Co., 724 Main street, Kansas City, Mo., include one from the George J. Renner Brewing Co., Akron, Ohio, for a Pennell flask-type condenser with a capacity of 55 tons of ice per day. Another order is from the Athens (Ohio) Ice & Storage Co., where the capacity will be 25 tons of ice per day. Mr. M. Freeman Smith, secretary of the Atmospheric Condensation Co., made a hurried business trip just prior to Christmas, and on his return stated he was thoroughly convinced that ice-making companies and others needing so much ice as to be justified in manufacturing it for their own use are an alert set of men and seemed to appreciate what it means to secure crystal ice without reboiling. This is made possible by using the Pennell condenser.

Now Occupying New Plant.

The Dixie Manufacturing Co., manufacturer of exhaust fans, exhaust and blow-piping, dust collectors and automatic furnace feeders, is now located in its new plant, Stockholm and Russell streets, Baltimore, Md. This company came originally from Greensboro, N. C., and located in Baltimore on North street, where it soon outgrew the facilities, and as a result purchased the site and erected a modern fine building at the new location. This building occupies 60x155 feet, including the office, and the plant is one of the best equipped blow-pipe shops in the country, electricity being used for power. In addition to shipping its products to all points in the South, the company also includes Pennsylvania, New York State, New Jersey, Delaware and West Virginia in its territory, and is much encouraged at the volume of trade it secured in those States during the past year. The Dixie Manufacturing Co. offers its services as mechanical expert in the removal of shavings, dust, lint and odors.

Demand for the Bitulithic Pavement.

All over the country there is an increasing demand for the bitulithic pavement for city streets, and many contracts are being awarded. This pavement is the system originated and introduced by the Warren Brothers Company of 93 Federal street, Boston, Mass. Among recent contracts awarded for bitulithic work were the following: Edmondton, Canada, 55,000 square yards, awarded to Warren Bituminous Paving Co. of Toronto, Ont.; St. Louis, Granite Bituminous Paving Co., an additional contract for 42,429 square yards; Niagara Falls, N. Y., Warren Brothers Company of Boston, 21,200 square yards; Scranton, Pa., additional contract for 2518 square yards to Standard Bitulithic Co.; Dallas, Texas, Texas Bitulithic Co., for 23,694 square yards; Toronto, Ont., for 11,711 square yards to Warren Bituminous Paving Co.; Indianapolis, Hoosier Construction Co., 6000 square yards; Spartanburg, S. C., 10,886 square yards to Atlantic Bitulithic Co.; Mobile, Ala., Southern Bitulithic Co., 5307 square yards in addition to 40,000 yards announced previously; South Bethlehem, Pa., Standard Bitulithic Co. of New York, 23,311 square yards; Asheville, N. C., Atlantic Bitulithic Co., 6500 square yards. A contract for building the municipal asphalt plant at Brooklyn, N. Y., has been awarded to the Warren Asphalt Co. at $22,485.

The Austin-Smith Engineering Co.

The urgent and diverse needs for all classes of engineering service during recent years have been followed by the establishment of numerous enterprises aiming to meet the requirements of inventors, manufacturers, machinery builders and others concerned. Companies comprising a membership of skilled engineers have been formed to be prominent in this field of endeavor. Among them is the Austin-Smith Engineering Co., mechanical and electrical engineer, 119 Hollingsworth street, Baltimore, Md. This company prepares plans and specifications for manufacturing plants, designs and manufactures special machinery, develops inventions, does experimental and machine work, etc. It is composed of men of thorough knowledge in their chosen profession and will make the South its especial territory. Mr. Sydney B. Austin, president, is a graduate of Cornell and has had much experience in engineering work of all kinds. He was the designer for the Hadaway Engineering Co. of New York, also for the Riter-Conley Manufacturing Co. of Pittsburg, and for the last three years has been in charge of the Rowland Telegraphic Co. as mechanical engineer. Mr. R. Tynes Smith, Jr., the vice-president, and Wm. H. Smith, the treasurer, are both graduates of the University of Wisconsin as mechanical engineers. Mr. R. Lee Slingluff is secretary.

It Gives Fire Protection.

At this season of the year superintendents of mills and factories are likely to be perplexed over the subject of protecting the exposed portions of their buildings and plants against fire. It is not uncommon in a plant to find the fire extinguishers stored in the engine-room to keep them from freezing and the fire buckets and barrels emptied for the same reason; in extreme weather the water hydrants may be frozen solid. This leaves the plant almost absolutely without fire protection. This situation can be relieved by using the "safety fire-bucket tank." These tanks have been used for the past seven years by the Pillsbury and the Washburn-Crosby mills in Minneapolis and Duluth, where the temperature goes from 25 to 40 degrees below zero. They remain in the mills all seasons of the year without a particle of ice forming in the solution. New York harbor is generally considered a severe point in cold weather. For the past 10 years the ferry boats of the Pennsylvania, Delaware, Lackawanna & Western Railroad, Central Railroad of New Jersey, Erie, West Shore and the municipal line to Staten Island plying in this harbor have been equipped with these "safety fire-bucket tanks," and on the hurrican decks, where they are exposed to all sorts of weather, they remain in perfect condition and are always ready for use, winter and summer. The Merchants' Refrigerating Co. of New York has just installed 50 tanks in its plant, where the temperature never gets higher than 10 degrees below zero. To any reliable firm interested in the best fire protection for all seasons the Safety Fire Extinguisher Co., 29 West 42d street, New York, manufacturers of the tank mentioned, will send a complete tank for experimental purposes. This can be returned at the maker's expense if not satisfactory. "Better Fire Protection," a booklet published by the company, can be had on application.

The N. P. Pratt Laboratory.

Southern manufacturing plants include a number which have become noted not only in the South, but also in other sections of the country for their work in designing, building and equipping industrial plants of various kinds. Possibly no Southern enterprise is better known generally than the N. P. Pratt Laboratory, chemical engineers and contractors, Atlanta, Ga. This institution's facilities are entirely modern and complete. It builds (among other plants) sulphuric acid and fertilizer works. Not only does the laboratory design such plants (consulting preferences of owners), but upon approval of plans, contracts to erect the works complete, guaranteeing the efficient and economical working of same, and transfers the plant to the owners, after training the latter's operating force. Given the land, the spur tracks and the water supply, the N. P. Pratt Laboratory will furnish the plant fully equipped in every department, including water-works, fire protection, elevated steel tank and tower, concrete surface reservoir, electric-light equipment, niter-house, chemical and fertilizer departments and offices. Among the sulphuric acid and fertilizer plants the Pratt Laboratory has built recently are those of the National Acid Co. and Planters' Fertilizer & Chemical Co., New Orleans; Gulfport (Miss.) Cotton Oil Fertilizer & Manufacturing Co., Meridian Fertilizer Factory, Hattiesburg, Miss., and Tupelo (Miss.) Fertilizer Factory. Mention of the N. P. Pratt Laboratory seems hardly complete without reference to the recent regrettable death of Dr. N. A. Pratt, the well-known chemist, who, with his two sons, Messrs. N. P. and G. L. Pratt, of the N. P. Pratt Laboratory, became well known throughout the entire country. Dr. Pratt's discoveries and activities were important factors in Southern industrial progress, especially in the development of phosphate rock in the rivers of South Carolina, the manufacture of sulphuric acid and fertilizers and improvements to various mechanical features in blast furnaces, etc.

Recent Large Generator Sales.

Among the recent large generator sales of the Crocker-Wheeler Company of Ampere, N. J., are the names of firms who have used electric power for a number of years and are probably the best authority for the selection of high-grade apparatus. The contracts included Waynesboro Electric Light & Power Co., Waynesboro, Pa., one 300-kilowatt engine-type arternating-current generator, 2300 volts, 164 revolutions per minute, 60 cycle; Republic Iron & Steel Co., Youngstown, Ohio, one 200-kilowatt engine-type direct-current generator, 250 volts, 100 revolutions per minute; Interstate Iron & Steel Co., East Chicago, Ill., one 225-kilowatt engine-type alternating-current generator, 250 volts; Charles C. Morse & Co., San Francisco, one 200-kilowatt alternating-current generator, 2300 volts, 60 cycle, and one 13-kilowatt generator, 125 volts, 950 revolutions per minute as exciter; Williams Construction Co., Corinth, Miss., three 150-kilowatt engine-type alternating-current generators, 3-phase, 2300 volts, 225 revolutions per minute, to furnish power for lighting city; Crown Cork & Seal Co., Highlandtown, Baltimore, Md., one 150-kilowatt direct-current generator, 125 volts, 225 revolutions per minute, and Trimont Manufacturing Co., Roxbury, Mass., one 100-kilowatt belt-type alternating-current generator, 240 volts, 600 revolutions per minute. The town of Brookhaven, Miss., awarded contracts for a new municipal lighting plant, consisting of one 200-kilowatt and one 100-kilowatt alternating-current generators to furnish lighting and power for the street lights, etc. The contract for the generator was secured by the Crocker-Wheeler Company. The ratings of these machines are as follows: One 200-kilowatt engine-type alternating current generator, 3-phase, 60-cycle, 2300 volts, 200 revolutions per minute, and one 100-kilowatt belt-type alternating-current generator, 3-phase, 60-cycle, 2300 volts, 700 revolutions per minute. A 13 kilowatt generator is to be furnished as exciter for the belt-type generator. This will give the plant a capacity of 300-kilowatt alternating current.

Demand for Powhatan Clay Bricks.

It would seem as if the demand for Powhatan clay bricks increases just in proportion to the increase of building operations in the South. The manufacturer of the product named is the Powhatan Clay Manufacturing Co. of Richmond, Va., and it is supplying bricks for many buildings at present, while some of the most prominent structures of the year were built of Powhatan bricks. The company enumerates the following orders as of interest: Cream white, silver gray and salt and pepper face brick for many of the skyscrapers and prominent buildings in New York, Boston, Philadelphia, Baltimore and Washington, and for hundreds of buildings in the South, including the Jefferson and Murphy hotels, Richmond; Windsor Hotel, Jacksonville; Cox Hotel, High Point; Hotel Jerome, Columbia; university buildings, Chapel Hill; Southern Railway and union passanger stations in Knoxville, Savannah, Asheville, Durham, Charlotte, Winston-Salem, Richmond, Mobile, Spartanburg, Greenville, Wilmington and Columbia. Also government buildings for disabled veterans, Johnson City; Memorial Hospital, Richmond; St. Leo's Hospital, Greensboro; Virginia Club, Norfolk; telephone buildings at Richmond, Charleston, Augusta; libraries at Charleston, Winston and Albany; theaters at Richmond, Columbia, Macon, Detroit and Darlington; City National Bank, Dallas; People's Bank, Georgetown; Hibernia Bank, New Orleans; Bank of Leesville; Citizens' Bank, Millen; American National Bank, Richmond; National Bank of Petersburg; Citizens' Bank, Savannah; First National Bank, Jacksonville; courthouses at Wytheville and Marion, Va.; Albany, Abbeville, Louisville, Washington, Valdosta and Monticello, Ga.; Lake City, Fla.; office buildings—Grand, Macon; Stahlman, Nashville; Hibernia, New Orleans; Napier, Macon; Virginia State and American National, Richmond; churches—First Presbyterian, Union; Grove Avenue Baptist, Richmond; Central Congregational, Atlanta; Five Point Methodist, Birmingham. The gray bricks made at the Powhatan works have the blue gray in such demand.

Recent Fred W. Wolf Sales.

Since its recent report of sales the Fred W. Wolf Company of Chicago has received many contracts. A list of these contracts is of interest. It follows: Standard Brewery, Chicago, 75-ton refrigerating plant; Lima (Ohio) Pork Packing Co., 30-ton refrigerating plant; Barry (Ill.) Provision Co., 15-ton refrigerating plant; Cerveceria Guauhtemoo, Monterey, Mexico, large fittings order; Crystal Ice & Bottling Co., Brownwood, Texas, large order fittings; Jos. Schlitz Brewing Co., Milwaukee, 880-ton refrigerting; Geo. W. Taylor, Norfolk, 100-ton ice plant; Phoebus Coal & Ice Co., Hampton, Va., 25-ton ice plant; Chicago (Ill.) Butchers Packing Co., Chicago, Ill., 60-ton refrigerating; Central Ice & Cold Storage Co., Dallas, Texas, 25-ton ice; Chicago (Ill.) Athletic Club, Chicago, Ill., two 30-ton refrigerating; Lone Star Brewing Co., San Antonio, Texas, 35-ton freezing system; American Brewing Co., Houston, Texas, 25-ton freezing system; Cisco (Texas) Ice Co., 20-ton ice; San Saba (Texas) Light, Ice & Bottling Co., 10-ton ice; Hygeia Brewing Co., Passaic, N. J., 75-ton refrigerating; Citizens' Light & Power Co., Lenoir, N. C., 5-ton ice plant; M. Burkhardt Brewing Co., Akron, Ohio, 5000 feet of two-inch direct expansion piping, 6 sections atmospheric ammonia condenser and one 10-ton Wolf patent counter-current steam condenser; J. H. Nation Meat & Supply Co., El Paso, Texas, large fittings order; City Brewery, Stuebenville, Ohio, 13-ton freezing system; Messrs. Paul & Henry, Barberton, Ohio, 15-ton ice plant; Valdosta (Ga.) Ice & Manufacturing Co., 30-ton refrigerating; Diebolt Brewing Co., Cleveland, Ohio, freezing system; Peabody (Kan.) Light & Power Co., 5-ton ice; Highland Hotel Co., Charlotte, N. C., 12-ton refrigerating machine, 2-ton ice-freezing system; Indiana Hotel Co., Indianapolis, 30-ton refrigerating, with ice tank and coils; British Columbia Market Co., Victoria, B. C., 15-ton refrigerating; Glynn Ice Co., Brunswick, Ga., 35-ton ice; San Juan Fishing & Packing Co., Seattle, Wash., 50-ton ice; Gutsch Brewing Co., Sheboygan, Wis., 50-ton refrigerating; Denton (Texas) Milling Co., 20-ton ice; Consumers' Ice Co., Charleston, S. C., 35-ton ice; Arctic Ice & Refrigerating Co., Wichita, Kan., 50-ton ice and additional 50-ton refrigerating; John W. Hall & Sons, Russellville, Ala., 6-ton ice; Clinton Ice & Compress Co., El Reno, Okla., 20-ton ice; Heilemen Brewing Co., La Crosse, Wis., direct expansion piping for stockhouse and condensers; T. R. Sawtell, Atlanta, 21-ton freezing system; Oscar Mayer & Bros., Chicago, direct expansion piping; Interstate Packing Co., Winona, Minn., 40-ton refrigerating; Independent Pure Ice Co., Chicago, 100-ton can icemaking plant, two 50-ton units; El Campo (Texas) Light, Ice & Water Co., 10-ton ice; Mutual Ice, Fuel & Storage Co., Kansas City, 50-ton ice; Crescent Cream Co., Los Angeles, Cal., 20-ton refrigerating; Missoula (Mont.) Mercantile Co., 20-ton refrigerating; British Columbia Market, Vancouver, B. C., 25-ton refrigerating; Coffin Packing & Provision Co., Denver, Col., 25-ton refrigerating; Consumers' Brewing Co., Norfolk, 120-ton refrigerating; Lauritzen Malt Co., Minneapolis, Minn., 40-ton refrigerating.

Carthage Superior Limestone.

It is becoming generally known that Carthage limestones, produced on an extensive scale near Carthage, in Southwest Missouri, equals any stone quarried and excels much of it. Referring to the qualities of this limestone, one well posted on the subject says: "Carthage limestone possesses the strength of granite (compressive strength on the bed 20,261 pounds and on edge 16,551 pounds per square inch). Its texture is so close as to make the ratio of absorption amount to practically nothing. As a consequence, Carthage limestone has been found to possess great weathering resistance. It also possesses a beautiful white appearance, enlivened by the crystallization, which in that respect places the product in a class with marble. Carthage limestone shows up beautifully in all classes of cut-stone work, and retains indefinitely the clear outlines produced by the cutting tool. When used for steps in continuous use it will show no greater wear than the hardest granites, and will admit of no comparison in that respect with other limestones and marbles. Carthage limestone has likewise been found one of the most valuable crusher products produced in recent years. Its natural cementing qualities are such that it has been proven in actual practice to save fully one-third of cement as against the ordinary run of materials. In this connection it must be remembered that crushed granite does not possess the cementing qualities of even many inferior crushed limestones. It has been found advantageous to apply Carthage crushed limestone containing all undersize to the entire exclusion of river sand, and results have been such that the market for the undersize is assuming immense proportions. As a direct consequence limestone sand is fast superseding river sand where high-classed concrete construction is desired. Carthage marble dust has also been applied with eminent satisfaction for pointing up mortar joints, particularly in pressed-brick

work. Its general qualifications are proven by the fact that it is today marketed for ballast, macadam, concrete work of every description, as coarse or fine limestone sand, according to grade of screening; poultry food, fertilizer and flux, filtering and roofing material, chippings in stucco work with pebble-dash effect, coarse and fine marble dust, paint and putty filler, soap and polishing powder and asphalt surfacer. The general qualifications of Carthage limestone in connection with its chemical purity make possible such a variety of applications. Carthage limestone will analyze as follows: Insoluble, .0063 per cent; aluminum and iron, .0018; magnesium carbonate, .006, and calcium carbonate, .9927; total, 1.0068 per cent." One of the largest shippers, if not the largest shipper, of Carthage limestone in its sawed state for building purposes is the Carthage Superior Limestone Co., and for crusher purposes the Carthage Crushed Limestone Co., both managed from the same office at Carthage, Mo. These companies have the most modern equipments. They have adopted the central-power plant to such an extent that the motive power for all operations, except the stone channelers, is furnished by one 500-horse-power Bates-Corliss engine. This engine operates the stone sawmill by lineshaft drive, and by means of a 125-kilowatt belted generator furnishes current for the large crushing plant and quarry operations in general. Six gangs of saws, two of double capacity, produce 20,000 cubic feet of sawed stone per month. The double gangs will take stone measuring 10 feet long by 9 feet wide by 6 feet high in one operation. The extreme hardness of Carthage limestone is indicated in the rate of sawing—two inches per hour at the most. Three channelers, two of the Sullivan type, channel the millblocks, and no blasting whatever is done, excepting on waste stone and boulders which are intended for the crusher. The stone is handled by a 30-ton derrick, 66-foot mast and 60-foot boom, but a contract has been given the Northern Engineering Works of Detroit, Mich., for a 30-ton 4-motor 75-foot span traveling crane. This crane will be in operation early in March. Runway for this crane will be entirely of steel, the material to enter into its construction weighing approximately 100 tons. The present purpose is to construct this runway 35 feet high by a length of 137 feet. The crushing plant operated by the Carthage Crushed Limestone Co. contains a large crusher and a 30x24-inch Jeffrey pulverizer. At this plant all the various crusher products mentioned before are produced partly by means of a 50-inch American blower, which collects the dust and thus helps produce a merchantable product. There is storage capacity for 12 cars in the bins, which will be further extended. The rough stone storage will enable the plant to run two days without replenishing the supply, broken stone being delivered by means of a cableway from the breaking yard. All operations at the crusher are conducted by means of motors. Drilling is carried on with airdrills.

TRADE LITERATURE.

Ingersoll-Rand Rock Drills.

According to leaflet recently sent out by the Ingersoll-Rand Company, 11 Broadway, New York, over 80,000 Ingersoll-Rand rock drills have been built and sold. This includes, it is claimed, probably more than 95 per cent. of all the drills in this country. The leaflet also contains illustrations of the various rock drills which the company manufactures, showing many of them in operation.

Concerning St. Petersburg, Fla.

Some interesting literature has been issued recently concerning the home, farming and industrial advantages of St. Petersburg, Fla., and its surrounding territory. This section of Florida has factors which will appeal to the person seeking to locate in a section where several crops of agricultural products can be raised in a season, where attractive homes can be established and where there are facilities for industry of various kinds. The Board of Trade of St. Petersburg issues the literature referred to.

From Pine Torch to Incandescent Lamp.

An important factor in advancing the human race from barbarity to civilization has been the evolution of lighting appliances. From the flickering pine torch to the resplendent incandescent lamp marks an epoch in civilizing influences. This thought is suggested by a perusal of the first of a series of leaflets to be issued on the subject of improved incandescent electric lamps. The quality of this first leaflet indicates that people interested in incandescent lamps are to be favored with some interesting literature on the subject, and it is a subject on which information of value will be appreciated. The leaflet refers to the introduction of the Buckeye lamp of 17 years ago and its improvement from year to year as experience has prompted and manufacturing processes and materials have permitted. The trade and lamp users who want to receive the series can send their names and addresses to the Buckeye Electric Co., the well-known manufacturer of incandescent lamps, Cleveland, Ohio.

A New Belt-Power Elevator Head.

Ever on the alert to make improvements in its apparatus, the Park Manufacturing Co., Charlotte, N. C., has recently compiled a pamphlet descriptive of its new steel-screw, belt-power elevator head, a machine of modern construction and design. All of the parts are extra heavy and contain modern attachments for safety and easy adjustment. If you are considering the installation of a hoisting apparatus of any kind write to the company for further details.

Instructions on Reinforced Concrete Construction.

Contractors, superintendents and others interested in reinforced concrete construction are advised that a booklet of value to them has been prepared. This publication is entitled "Instructions to Inspectors on Reinforced Concrete Construction," and is by George P. Carver, late division engineer, Florida East Coast Railway, Key West extension. It contains full information regarding the inspection of reinforced concrete construction and gives in detail the duties of concrete inspectors. The price is 35 cents. Address the author, George P. Carver, concrete engineer, Beverly, Mass.

"Volt" Belt—A Modern Oak Leather Belting.

So important in the operation of manufacturing plants is the transmission of power by belting that engineers are quick to take advantage of the latest improvements in this line. In this respect it is pertinent to refer to the product of the Hide, Leather & Belting Co., which has attained more than ordinary success in the manufacture of leather belting. In an attractive clothbound catalogue recently sent out not only are the company's methods of manufacturing belting fully described, but the various processes through which it passes while being made are shown in full-page illustrations. "Volt" belt, its acme of leather belting, is made from fine oak-tanned leather by power machinery. The laps are carefully cemented and fastened with a corrugated brass wire with countersunk heads and clinched points, making the belt as pliable in the laps as at any other point and securing the laps at every three-fourths of an inch. In addition the catalogue contains full description and prices of the many other supplies the company handles. Copies of this catalogue can be obtained from the Hide, Leather & Belting Co., 227 South Meridian street, Indianapolis, Indiana.

FINANCIAL NEWS

Review of the Baltimore Market.

Office MANUFACTURERS' RECORD,

Baltimore, Md., December 31.

In the Baltimore stock market during the last four days closing the year 1906 business was generally quiet, the feeling being characteristic of the holiday season, but at the close there was some activity.

In the trading United Railways common sold at 13 to 13½; the trust certificates at 13½; the income bonds from 57¾ to 58⅜; the funding 5s from 87 to 86½, and the funding scrip from 87 to 86½; the 4s at 89 to 89⅝. United Light & Power 4½s were dealt in at 93½; Consolidated Gas 5s at 112, and the 4½s at 96½ to 97. Seaboard 4s sold at 80¾ to 81½; the 10-year 5s at 100¼; the second preferred at 48; Consolidated Cotton Duck common at 12¼, and the preferred at 33; Cotton Duck 5s at 83⅜ to 83½; G.-B.-S. Brewing, 7 to 8; the incomes from 29½ to 31, and the 1sts from 57¼ to 57¾.

Exchange Bank stock sold at 180, and United States Fidelity & Guaranty at 108½ to 114; Merchants' Bank, 173; Citizens' Bank, 30; Maryland Trust preferred, 106.

Other securities were traded in as follows: Northern Central Railway stock, 107½ to 108; Atlanta & Charlotte 1sts, 103¾; Georgia, Carolina & Northern 5s, 109¾ to 110¼; Consolidation Coal, 95; Houston Oil common, 9¼ to 10¼.; do. preferred, 49 to 52; Atlantic Coast Line 4s, 97½; Georgia & Alabama 5s, 110¼ to 110½; Maryland & Pennsylvania 4s, 92½; Alabama Consolidated Coal & Iron preferred, 92; Coal & Iron Railway 5s, 105⅜; Virginia Midland 2d 6s, 107¾; Norfolk Railway & Light 5s, 97½ to 97; Carolina Central 4s, 95½; Newport News & Old Point general mortgage 5s, 90; Virginia Electric Railway & Development 5s, 100; Baltimore City 3½s, 1928, 103¾; Carolina Central 4s, 95; Wilmington & Weldon 5s, 117.

SECURITIES AT BALTIMORE.

Last Quotations for the Four Days Ending December 31, 1906.

Railroad Stocks.	Par.	Bid.	Asked.
Atlantic Coast of Connecticut	100	320	326
Georgia Southern & Florida	100	36	...
Georgia Sou. & Fla. 1st Pfd.	100	...	98
Georgia Sou. & Fla. 2d Pfd.	100	81	84
Norfolk & Portsmouth Trac.	..	27	...
Seaboard Company Common	100	22	23
Seaboard Company 2d Pfd.	100	47½	48½
United Railways & Elec. Co	50	13⅜	13½
Bank Stocks.			
Commercial & Far. White Ctfs.	100	...	120
Merchants' National Bank	100	...	178
National Exchange Bank	100	178¾	182½
National Howard Bank	10	12½	...
National Marine Bank	30	39	...
National Mechanics' Bank	10	27	...
National Union Bank of Md.	100	112	...
Third National Bank	100	...	150
Trust, Fidelity and Casualty Stocks.			
Baltimore Trust & Guarantee	100	322	330
Fidelity & Deposit	50	128	130
Maryland Casualty	25	57	58¾
Maryland Trust Pfd.	100	...	108
Mercantile Trust & Deposit	50	135	139
Union Trust	50	55	...
U. S. Fidelity & Guaranty	100	111	112
Miscellaneous Stocks.			
Ala. Con. Coal & Iron Pfd.	100	91¼	94
Con. Cotton Duck Common	50	...	13
Con. Cotton Duck Pfd.	50	32½	33½
Con. Gas, Elec. Lt. & P. Pfd.	..	80	...
G.-B.-S. Brewing Co.	100	7⅛	8½
George's Creek Coal	100	82½	...
Railroad Bonds.			
Atlanta & Charlotte 1st 7s, 1907		103¾	104
Atlantic Coast Line 1st 4s, 1952		97½	97⅞
Atlantic Coast Line (Conn.) 5s		108¾	...
Atlantic Coast Line (Conn.) 4s		...	91⅞
Carolina Central 4s, 1949		94	...
Charleston & West. Car. 5s, 1946		109½	110
Char., Col. & Aug. 1st 5s, 1910		115½	...
Char., Col. & Aug. 2d 7s, 1910		109	...
Columbia & Greenville 1st 6s, 1916		114	...
Georgia & Alabama 5s, 1945		110	...
Georgia, Car. & North. 1st 5s, 1929		110¼	...
Georgia Pacific 1st 6s, 1922		121	...
Maryland & Pennsylvania 4s, 1951		92½	...
Petersburg, Class A 5s, 1926		114	114½
Petersburg, Class B 6s, 1926		125	126
Piedmont & Cum. 1st 5s, 1911		102	...
Potomac Valley 1st 5s, 1941		113	...
Richmond & Danville Gold 6s, 1915		114	...
Seaboard Air Line 4s, 1950		81¾	81½
Seaboard Air Line 5s, 10-year, 1911		100¼	100½
Seaboard & Roanoke 5s, 1926		110¼	...
Silver Spgs., Ocala & Gulf 4s, 1918		96	98
South Bound 5s, 1941		109½	...
Western Maryland new 4s, 1952		83	...
West Virginia Central 1st 6s, 1911		107	...
Wilmington & Wel. Gold 5s, 1935		116½	117⅜
Street Railway Bonds.			
Anacostia & Potomac 5s, 1949		...	103
Atlanta Con. St. Rwy. 5s		106½	107
Baltimore City Passenger 5s, 1911		102¼	...
Baltimore Traction 1st 5s, 1929		111	112½
City & Suburban 5s (Wash.), 1948		...	104½
Citizens' R., L. & P. 5s (N. News.)		87	...
Lexington Rwy. 1st 5s, 1949		99½	100¼
United Railways 1st 4s, 1949		89¾	90
United Railways Inc. 4s, 1949		58¼	58½
United Railways Funding 5s		86½	86¾
Miscellaneous Bonds.			
Ala. Con. Coal & Iron 5s		90	92
Con. Gas 6s, 1910		106¾	...
Con. Gas 5s, 1939		111	112½
Con. Gas 4½s		96½	...
Con. Gas, Elec. Lt. & P. 4½s		82¾	84
G.-B.-S. Brewing 1sts		57½	57¾
G.-B.-S. Brewing 2d Inc.		30¾	31
Mt. V. & Woodb'y Cotton Duck 5s		83½	84
United Elec. Lt. & Power 4½s		93¼	93½

SOUTHERN COTTON-MILL STOCKS

Quotations Furnished by Hugh MacRae & Co., Wilmington, N. C., for Week Ending December 31.

	Bid.	Asked.
Abbeville Cotton Mills (S. C.)	94	96
Aiken Mfg. Co. (S. C.)	80	87½
Anderson Cotton Mills (S. C.)	...	100
Arkwright Mills (S. C.)	...	122
Augusta Factory (Ga.)	80	85
Avondale Mills (Ala.)	109	116
Belton Mills (S. C.)	108	110
Bibb Mfg. Co. (Ga.)	...	122
Brandon Mills (S. C.)	126	...
Cabarrus Cot. Mills (S. C.) new	120	130
Chadwick Mfg. Co. (N. C.) Pfd.	...	102
Chiquola Mfg. Co. (S. C.)	99	100
Clifton Mfg. Co. (S. C.)	122	125
Clifton Mfg. Co. (S. C.) Pfd.	102	105
Clinton Cotton Mills (S. C.)	150	...
Columbus Mfg. Co. (Ga.)	96	101
Courtenay Mfg. Co. (S. C.)	...	100
Dallas Mfg. Co. (Ala.)	92	95
Darlington Mfg. Co. (S. C.)	61	63½
Eagle & Phenix Mills (Ga.)	130	135
Easley Cotton Mills (S. C.)	132	136
Enoree Mfg. Co. (S. C.)	...	80
Enoree Mfg. Co. (S. C.) Pfd.	99	101
Enterprise Mfg. Co. (Ga.)	86	92
Exposition Cotton Mills (Ga.)	200	...
Gaffney Mfg. Co. (S. C.)	92	96
Gainesville Cotton Mills (Ga.)	40	50
Granby Cot. Mills (S. C.) 1st Pfd.	...	55
Graniteville Mfg. Co. (S. C.)	165	...
Greenwood Cotton Mills (S. C.)	90	92½
Grendel Mills (S. C.)	117	120
Henrietta Mills (N. C.)	200	...
King Mfg. Co., John P. (Ga.)	97	103
Lancaster Cotton Mills (S. C.)	105	107
Lancaster Cot. Mills (S. C.) Pfd.	97	99
Langley Mfg. Co. (S. C.)	92	96
Laurens Cotton Mills (S. C.)	...	166
Limestone Mills (S. C.)	115	125
Lockhart Mills (S. C.)	...	101
Lockhart Mills (S. C.) Pfd.	97	100
Louise Mills (N. C.)	90	95
Louise Mills (N. C.) Pfd.	...	98
Marlboro Cotton Mills (S. C.)	92	94
Mayo Mills (N. C.)	165	185
Mills Mfg. Co. (S. C.)	100	105
Mills Mfg. Co. (S. C.) Pfd.	99	101
Monaghan Mills (S. C.)	101	102
Monarch Cotton Mills (S. C.)	107	...
Newberry Cotton Mills (S. C.)	125	...
Norris Cotton Mills (S. C.)	108	110
Olympia Cot. Mills (S. C.) Pfd.	...	80
Orangeburg Mfg. Co. (S. C.) Pfd.	80	97
Orr Cotton Mills (S. C.)	101	104
Pacolet Mfg. Co. (S. C.)	180	190
Pacolet Mfg. Co. (S. C.) Pfd.	101½	104
Pelzer Mfg. Co. (S. C.)	170	173
Piedmont Mfg. Co. (S. C.)	170	177
Poe Mfg. Co (S. C.)	121	...
Richland Cot. Mills (S. C.) Pfd.	...	52½
Raleigh Cotton Mills (N. C.)	99	105
Roanoke Mills (N. C.)	...	140
Saxon Mills (S. C.)	109	...
Sibley Mfg. Co. (Ga.)	64	68
Southern Cotton Mills (N. C.)	...	80
Spartan Mills (S. C.)	145	155
Springstein Mills (S. C.)	...	100
Trion Mfg. Co. (Ga.)	130	142
Tucapau Mills (S. C.)	190	200
Union-Buffalo Mills Co., 1st Pfd.	75	90
Victor Mfg. Co. (S. C.)	124	130
Warren Mfg. Co. (S. C.)	99	100
Warren Mfg. Co. (S. C.) Pfd.	105	107
Washington Mills (Va.)	30	...
Washington Mills (Va.) Pfd.	100	115
Whitney Mfg. Co. (S. C.)	145	150
Wiscassett Mills (N. C.)	122	125
Woodruff Cotton Mills (S. C.)	120	125

Quotations Furnished by William S. Gleun, Broker, Spartanburg, S. C., for Week Ending December 31.

	Bid.	Asked.
Abbeville Cotton Mills (S. C.)	93	95
Aetna Cotton Mills (S. C.) Pfd.	...	70
Aiken Mfg. Co. (S. C.)	83	89
American Spinning Co. (S. C.)	120	125
Anderson Cotton Mills (S. C.)	...	103
Arcadia Mills (S. C.)	97	100
Arkwright Cotton Mills (S. C.)	117	...
Augusta Factory (Ga.)	80	85
Avondale Mills (Ala.)	109	...
Belton Mills (S. C.)	104	108
Bibb Mfg. Co. (Ga.)	...	115
Brandon Mills (S. C.)	120	...
Brogon Mills (S. C.)	77	80
Cabarrus Cotton Mills (N. C.)	120	...
Chadwick Mfg. Co. (N. C.) Pfd.	...	80
Chiquola Mfg. Co. (S. C.)	99	100
Clifton Mfg. Co. (S. C.)	120	125
Clifton Mfg. Co. (S. C.) Pfd.	...	103
Clinton Cotton Mills (S. C.)	140	145
Columbus Mfg. Co. (Ga.)	94	97
Courtenay Mfg. Co. (S. C.)	...	100
Dallas Mfg. Co. (S. C.)	90	...
Darlington Mfg. Co. (S. C.)	60	65
D. E. Converse Co. (S. C.)	117	...
Eagle & Phenix Mills (Ga.)	130	135
Easley Cotton Mills (S. C.)	132	136
Enoree Mfg. Co. (S. C.)	80	85
Enoree Mfg. Co. (S. C.) Pfd.	100	102
Enterprise Mfg. Co. (Ga.)	82	90
Exposition Cotton Mills (Ga.)	174	200
Gaffney Mfg. Co. (S. C.)	93	96
Gainesville Cotton Mills (Ga.)	40	...
Glenwood Cotton Mills (S. C.)	102	104
Gluck Mills (S. C.)	94	98
Granby Cot. Mills (S. C.) 1st Pfd.	50	...
Graniteville Mfg. Co. (S. C.)	155	165
Greenwood Cotton Mills (S. C.)	92	98
Grendel Mills (S. C.)	115	...
Hartsville Cotton Mills (S. C.)	101	104
Henrietta Mills (N. C.)	200	...
Inman Mills (S. C.)	97	100
King Mfg. Co., J. P. (Ga.)	97	103
Lancaster Cotton Mills (S. C.)	102	110
Lancaster Cot. Mills (S. C.) Pfd.	95	99
Langley Mfg. Co. (S. C.)	92	96
Laurens Mills (S. C.)	160	165
Limestone Mills (S. C.)	110	...
Lockhart Mills (S. C.)	99	102
Lockhart Mills (S. C.) Pfd.	...	101
Loray Cotton Mills (N. C.) Pfd.	101	...
Louise Mills (N. C.)	90	95
Louise Mills (N. C.) Pfd.	...	102
Marlboro Cotton Mills (S. C.)	84	...
Mayo Mills (N. C.)	150	200
Mills Mfg. Co. (S. C.)	99	100
Mills Mfg. Co. (S. C.) Pfd.	99	101
Mollohon Mfg. Co. (S. C.)	98	...
Monaghan Mills (S. C.)	101	...
Monarch Cotton Mills (S. C.)	101	106
Newberry Cotton Mills (S. C.)	125	...
Ninety-Six Cotton Mills (S. C.)	92	97
Norris Cotton Mills (S. C.)	106	...
Odell Mfg. Co. (N. C.)	...	90
Orangeburg Mfg. Co. (S. C.) Pfd.	80	...
Orr Cotton Mills (S. C.)	100	104
Pacolet Mfg. Co. (S. C.)	180	190
Pacolet Mfg. Co. (S. C.) Pfd.	102	104
Pelzer Mfg. Co. (S. C.)	167	175
Piedmont Mfg. Co. (S. C.)	167	...
Poe Mfg. Co., F. W. (S. C.)	120	125
Raleigh Cotton Mills (N. C.)	...	100
Richland Cot. Mills (S. C.) Pfd.	50	...
Roanoke Mills (N. C.)	118	...
Saxon Mills (S. C.)	107	...
Sibley Mfg. Co. (Ga.)	58	63
Southern Cotton Mills (N. C.)	...	63
Spartan Mills (S. C.)	150	155
Springstein Mills (S. C.)	...	100
Trion Mfg. Co. (Ga.)	132	140
Tucapau Mills (S. C.)	180	...
Union-Buffalo 1st Pfd.	75	...
Union-Buffalo 2d Pfd.	20	...
Victor Mfg. Co. S. C.)	115	...
Warren Mfg. Co. (S. C.)	97	100
Warren Mfg. Co. (S. C.) Pfd.	105	107
Washington Mills (Va.)	25	...
Washington Mills (Va.) Pfd.	100	105
Whitney Mfg. Co. (S. C.)	150	...
Wiscassett Mills (N. C.)	119	...
Woodruff Cotton Mills (S. C.)	120	125

[For Additional Financial News, See Pages 72 and 73.]